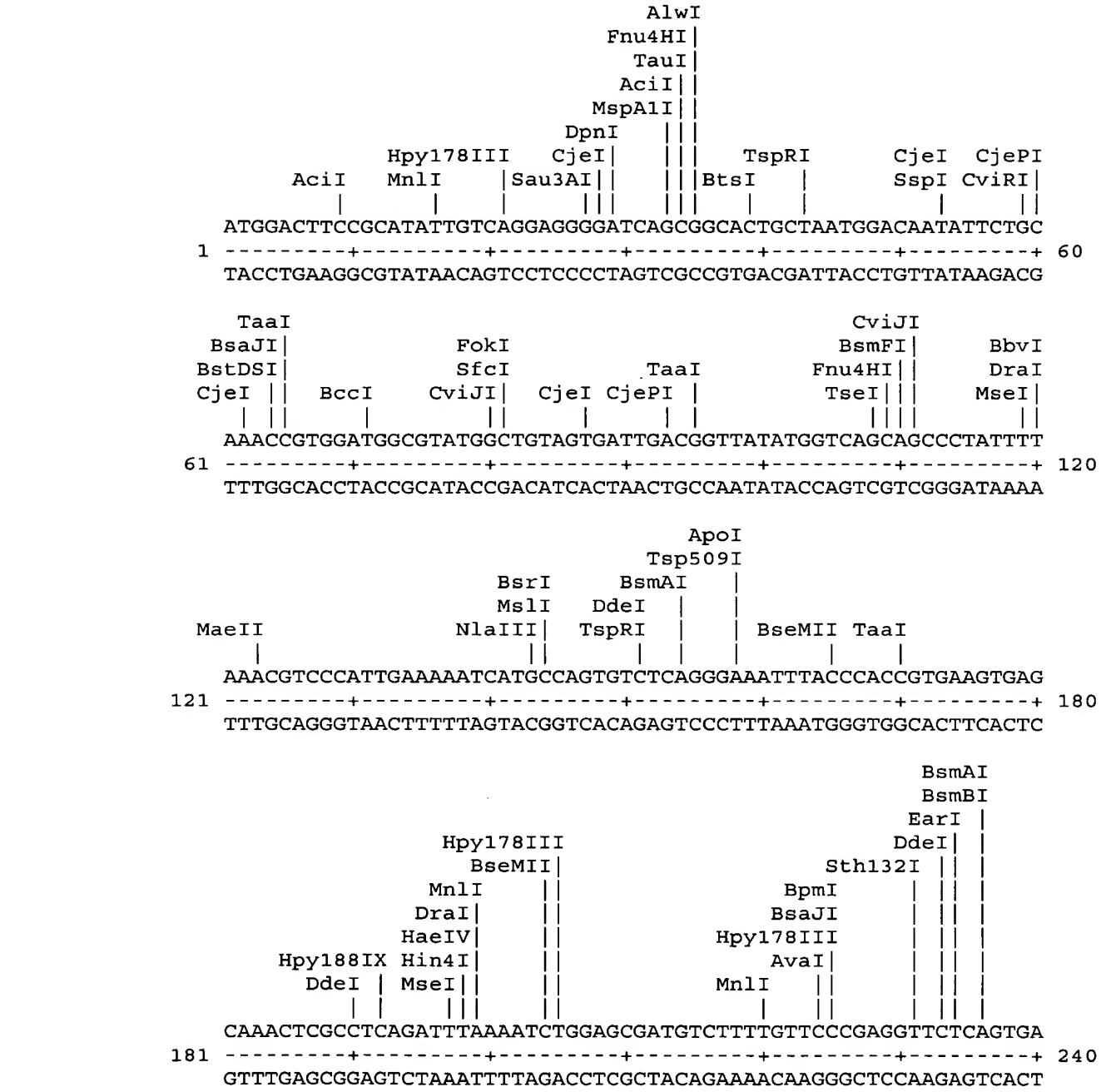
Figure 1A

Restriction enzyme analysis of CPN100686 (RY 54 - SEQ ID NO. 1)



Title: Chlamydia Antigens and Corresponding DNA Fragments and Uses Thereof
Inventor(s): Andrew D. MURDIN et al.
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Figure 1B

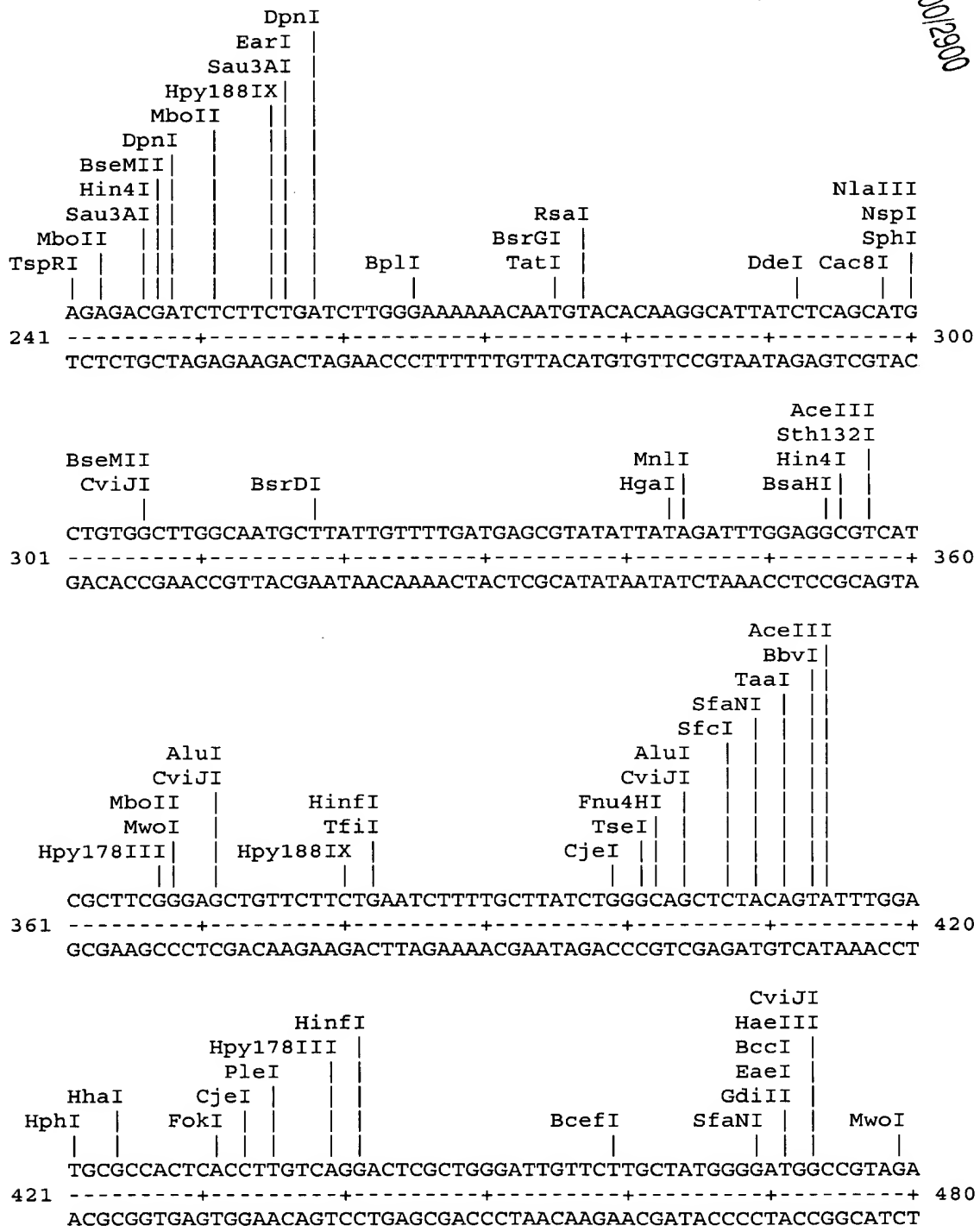
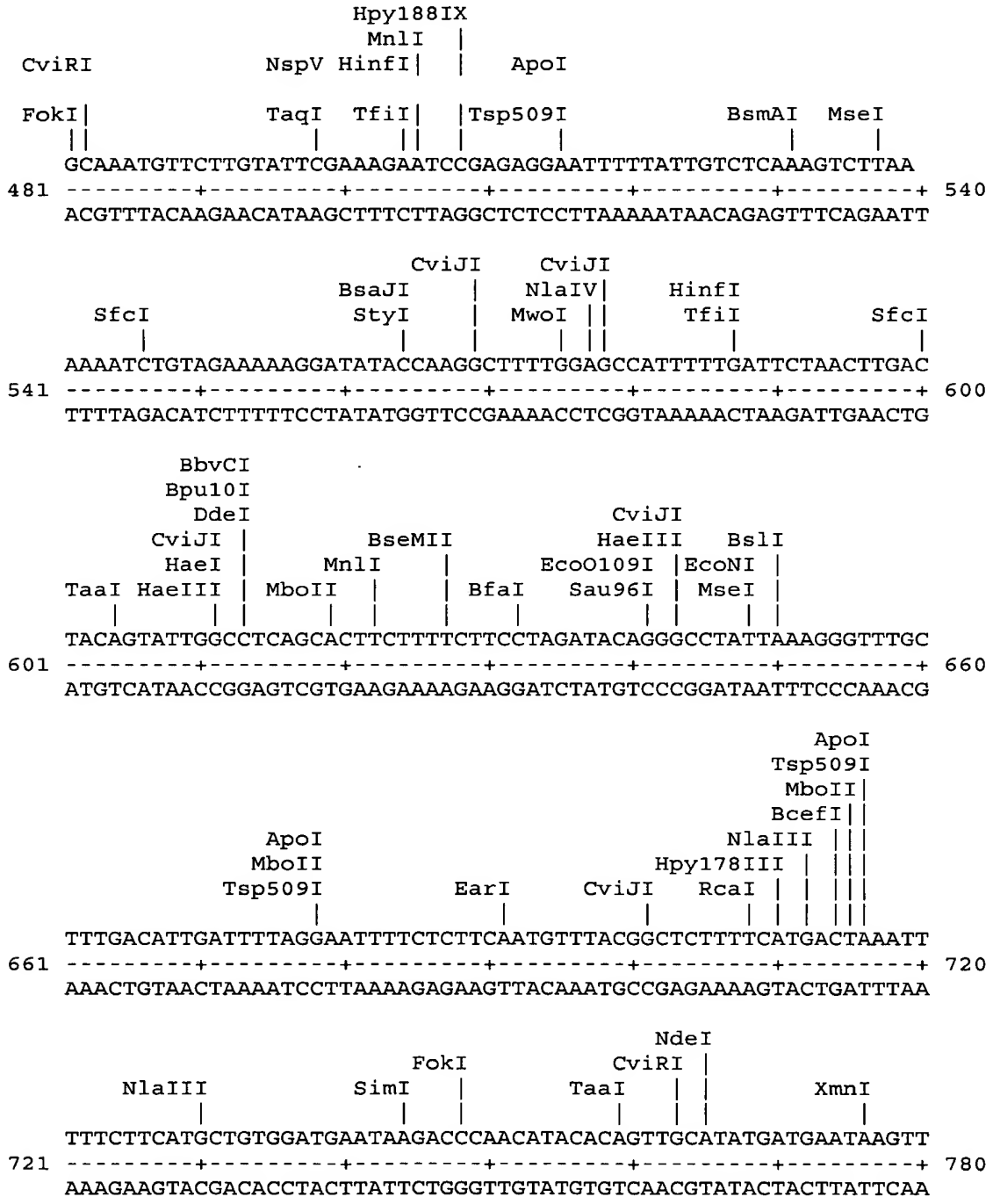


Figure 1C



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Inventor(s): Andrew D. MURDIN et al.
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Figure 1D

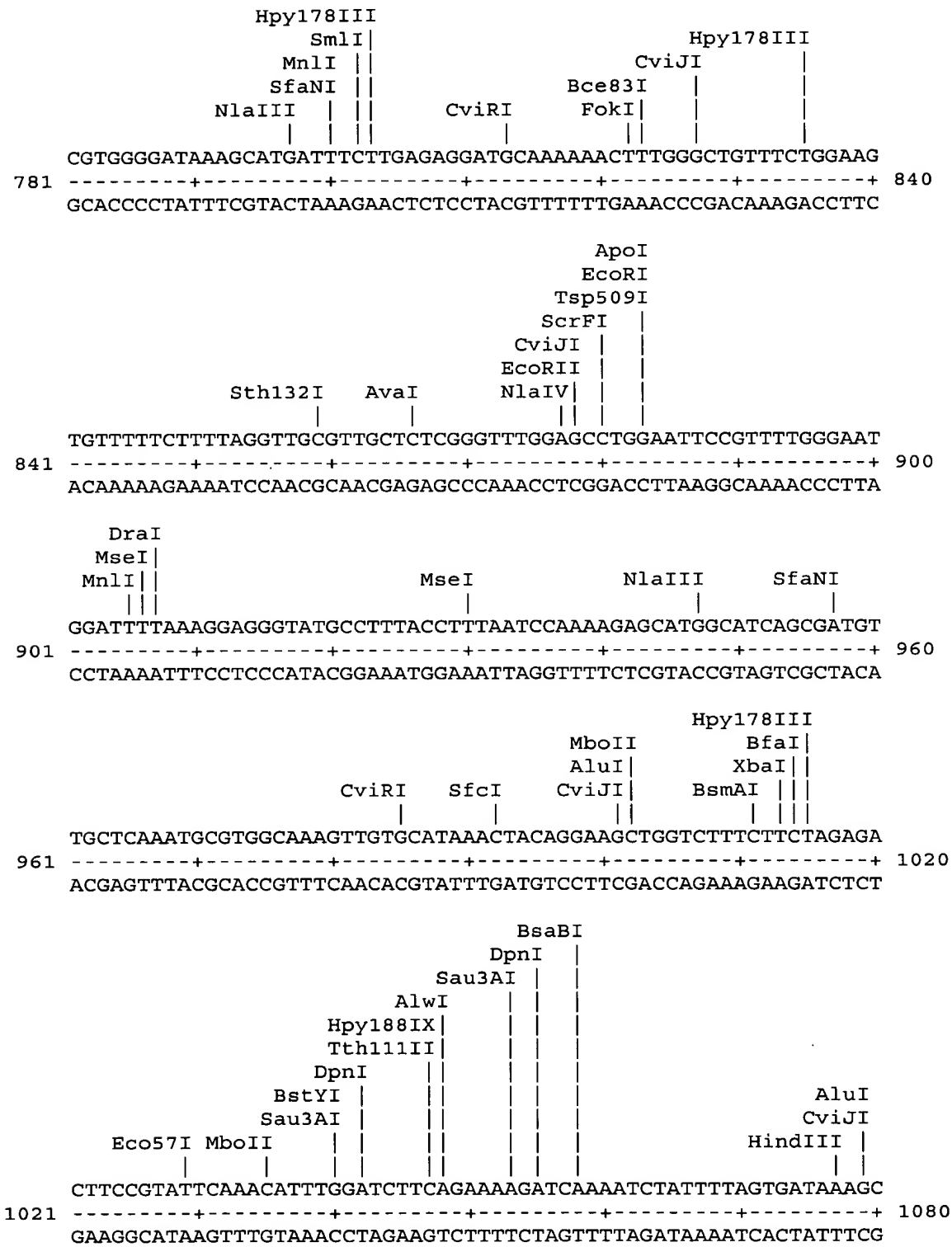

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Figure 1E

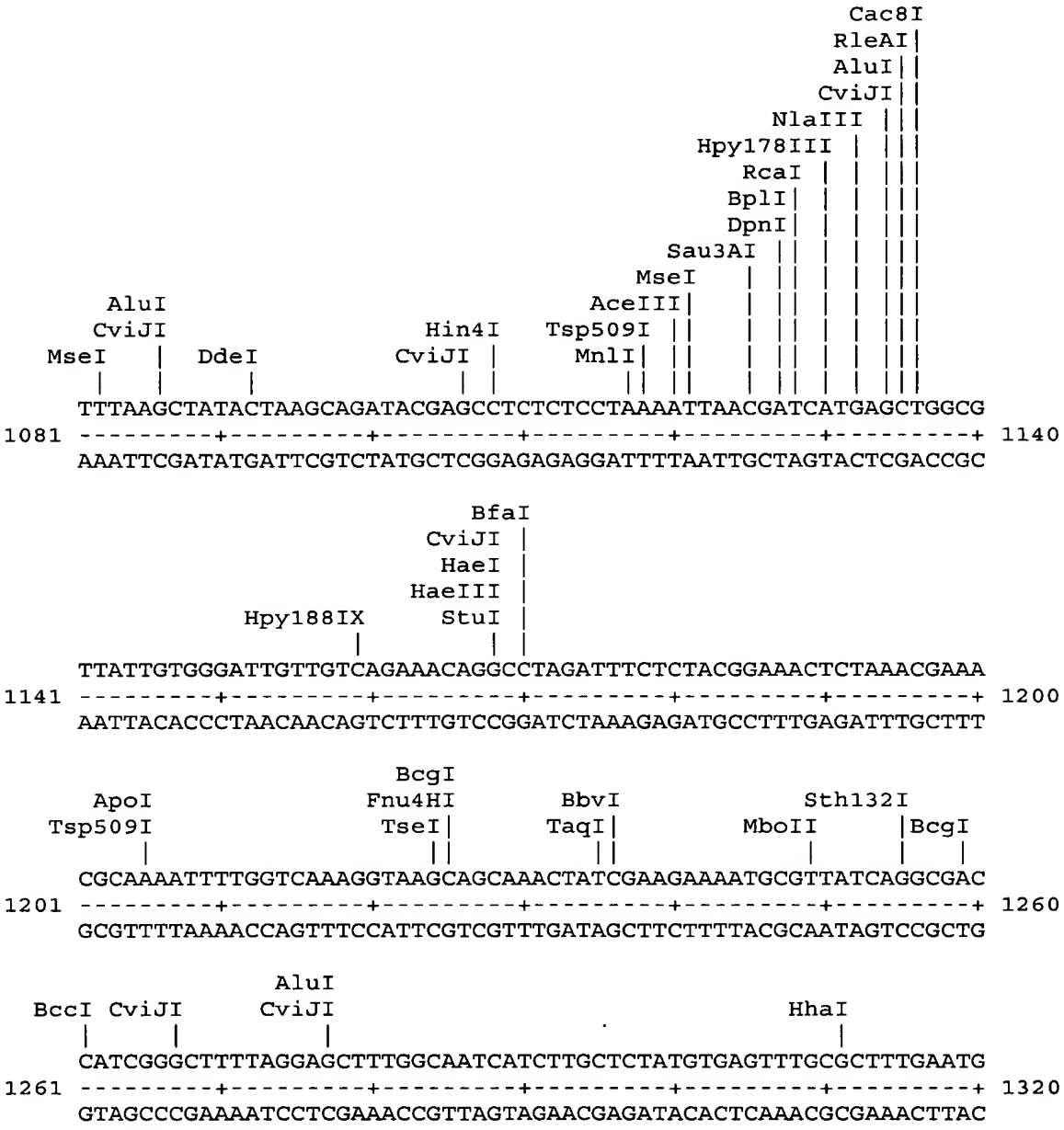

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Figure 1F

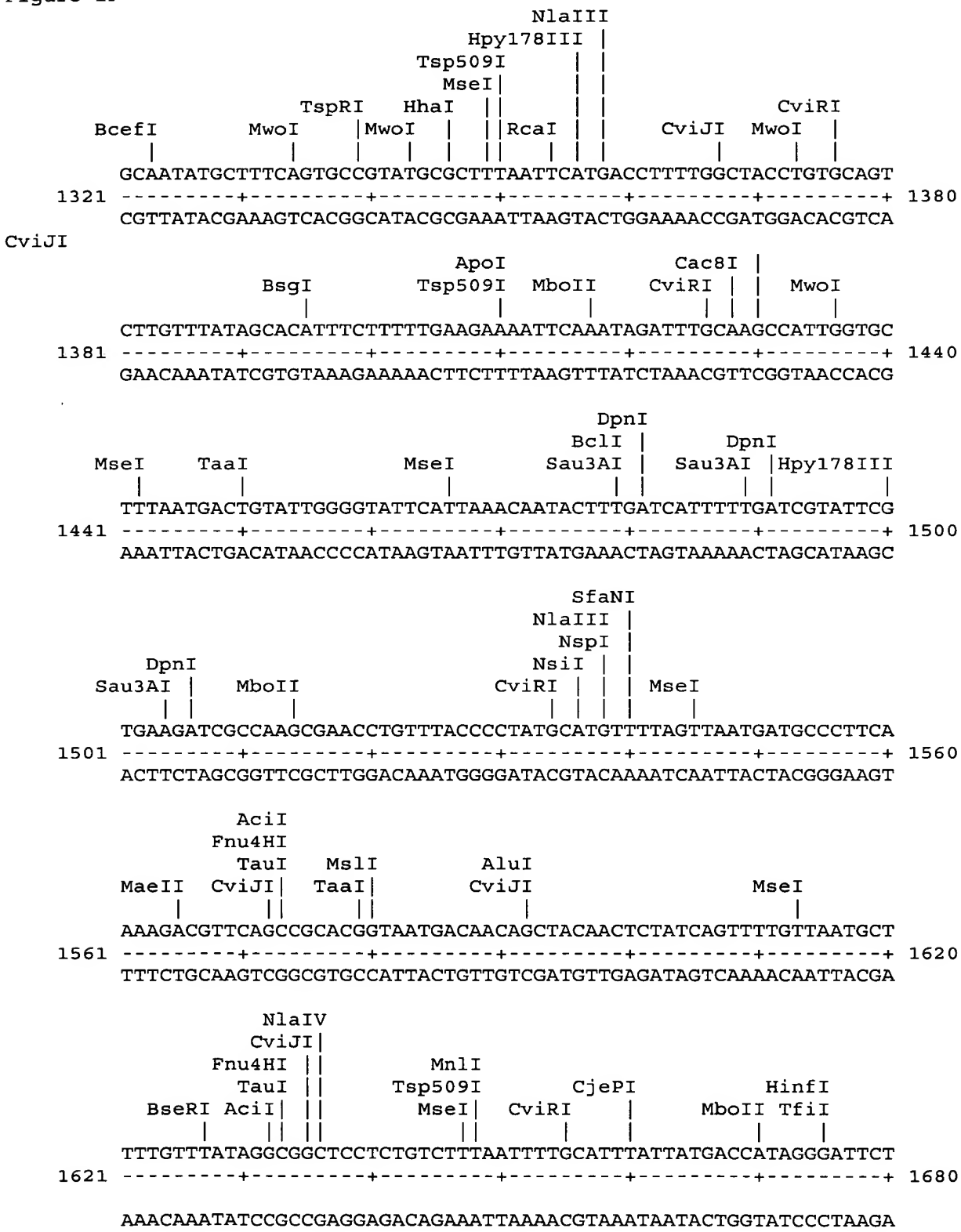

Figure 1G

Figure 2A

Restriction enzyme analysis of CPN100696 (RY 55 - SEQ ID NO. 2)

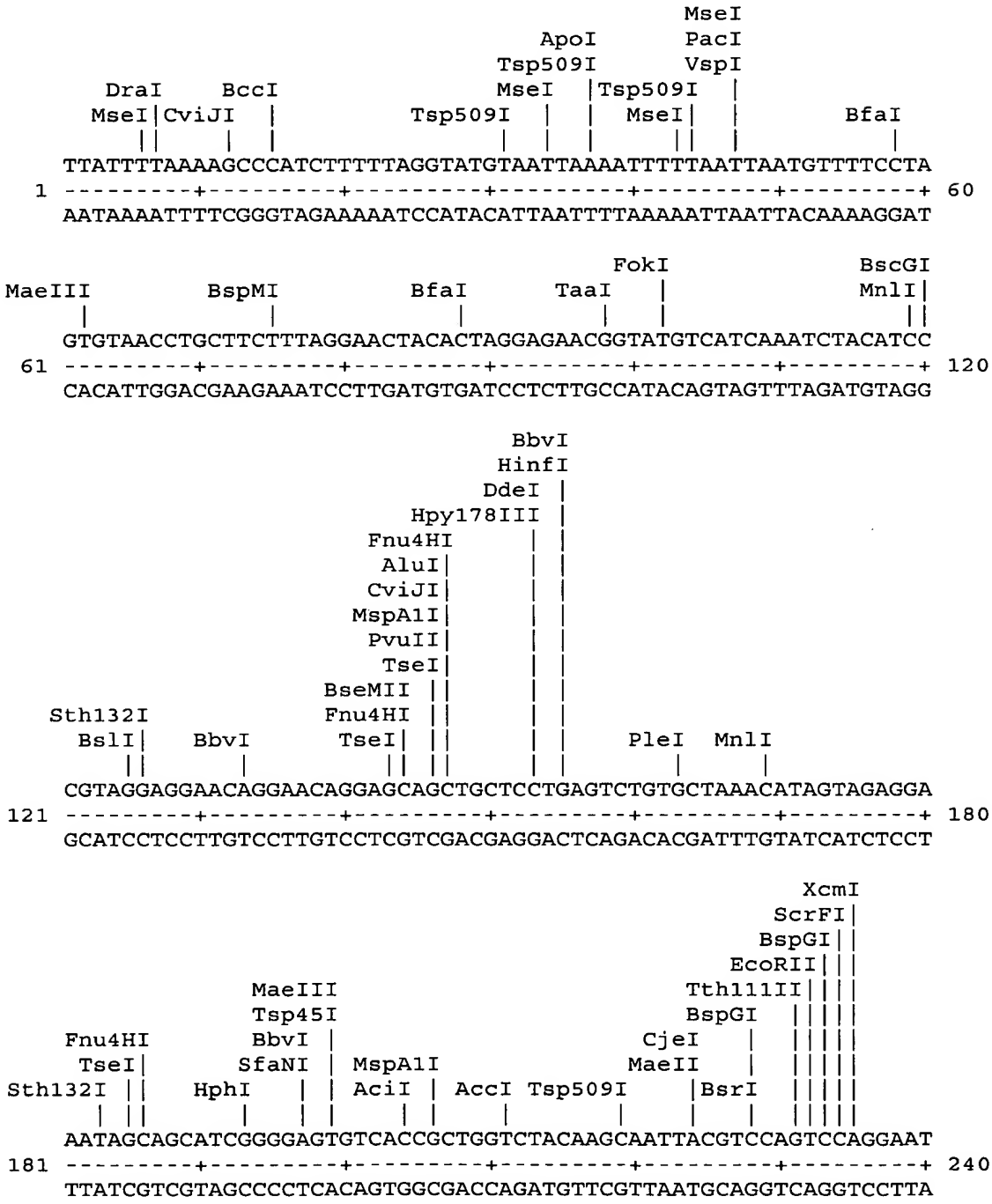

Figure 2B

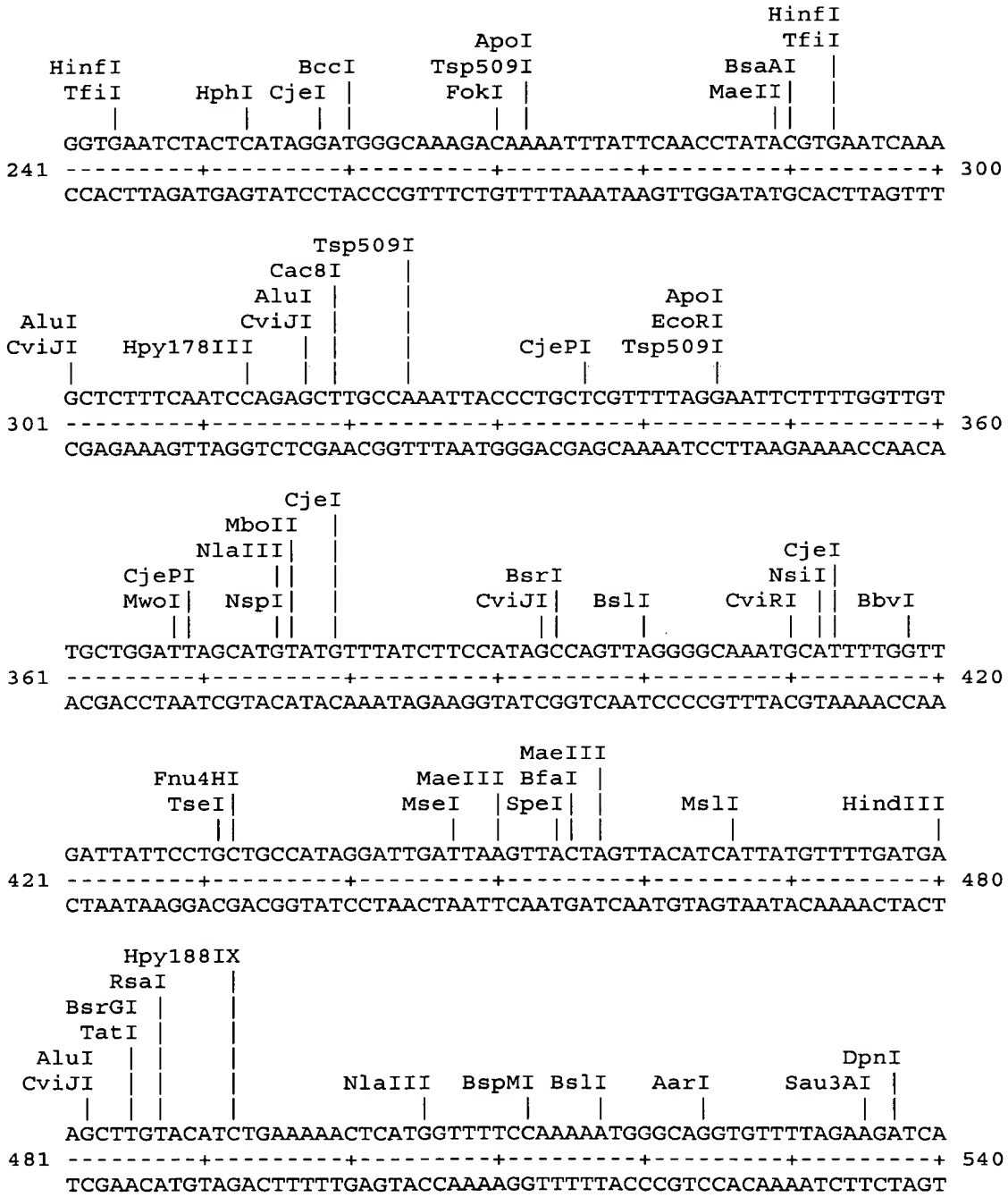

Figure 2C

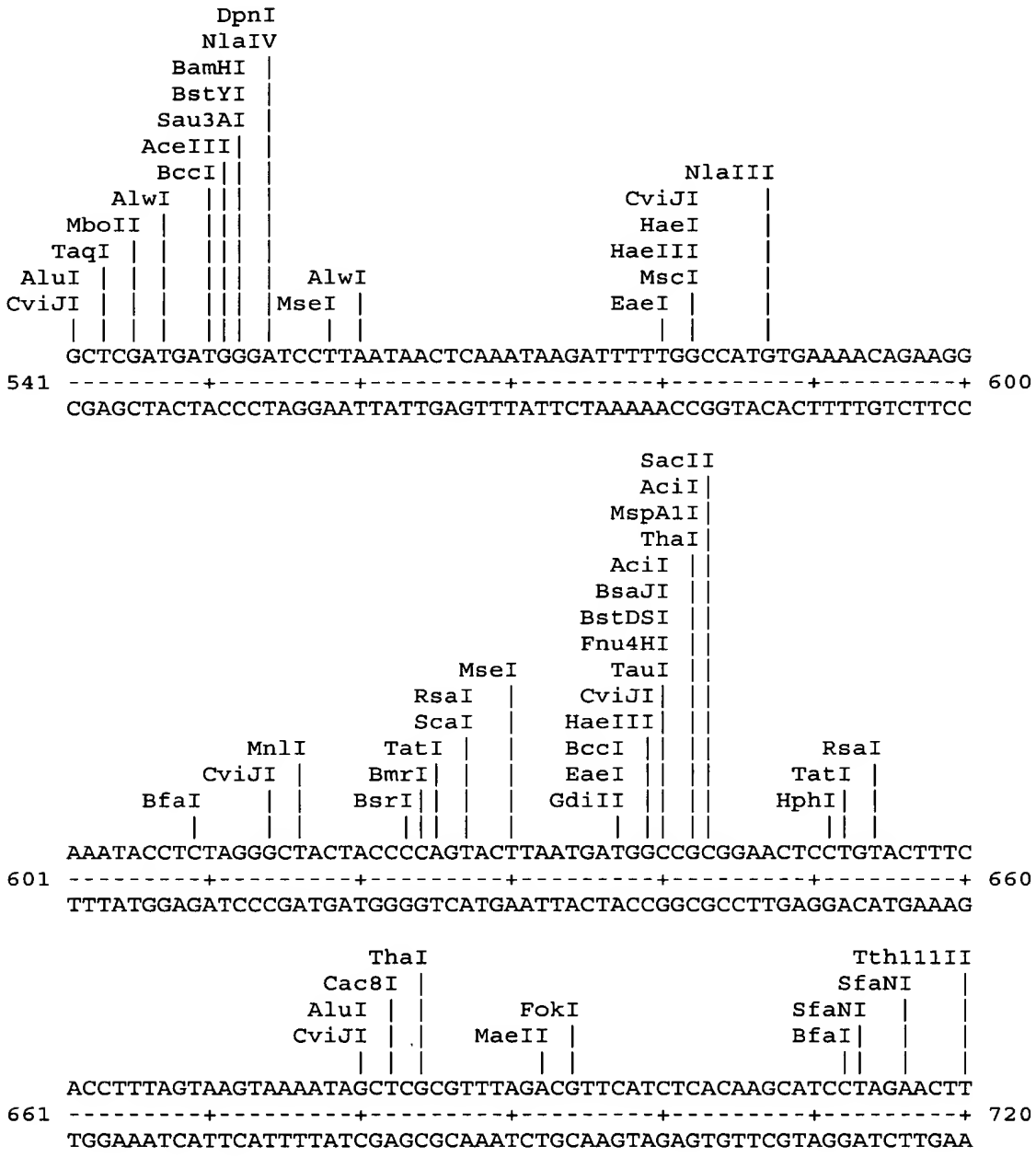

Figure 2D

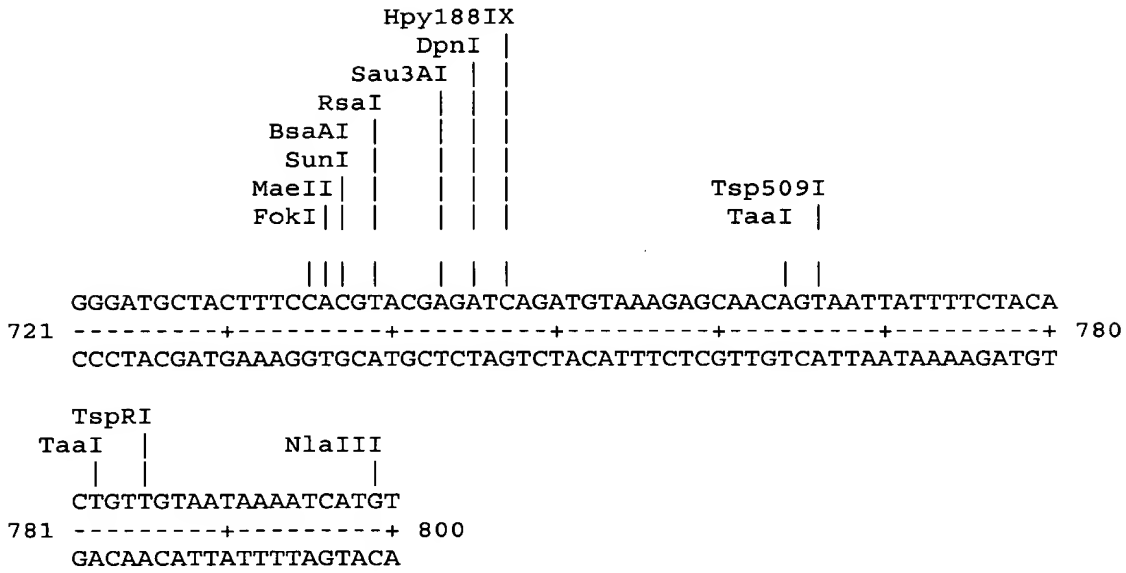

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Figure 3A
Restriction enzyme analysis of CPN100709 (RY 57 - SEQ ID NO. 3)

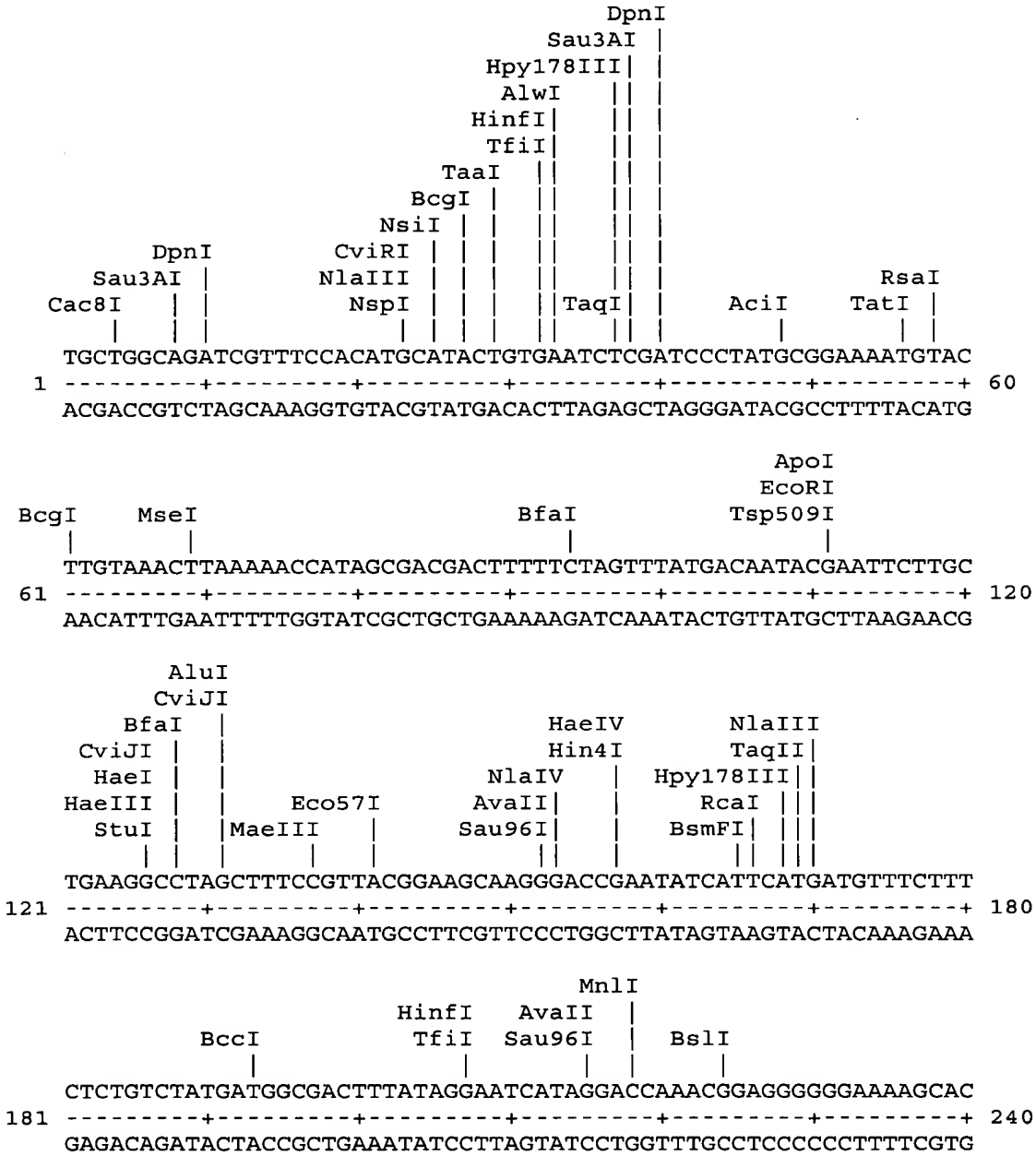

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Figure 3B

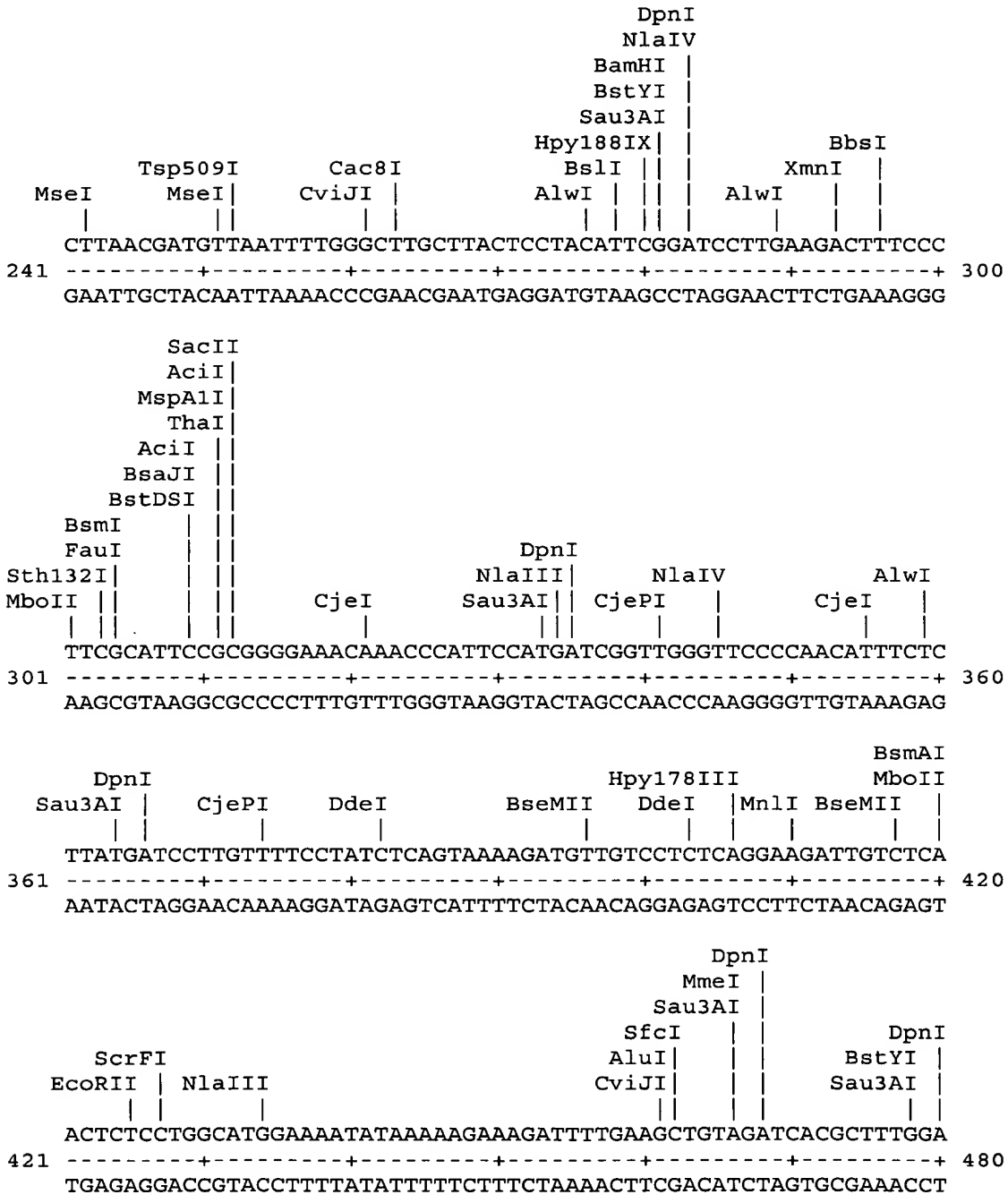


Figure 3C

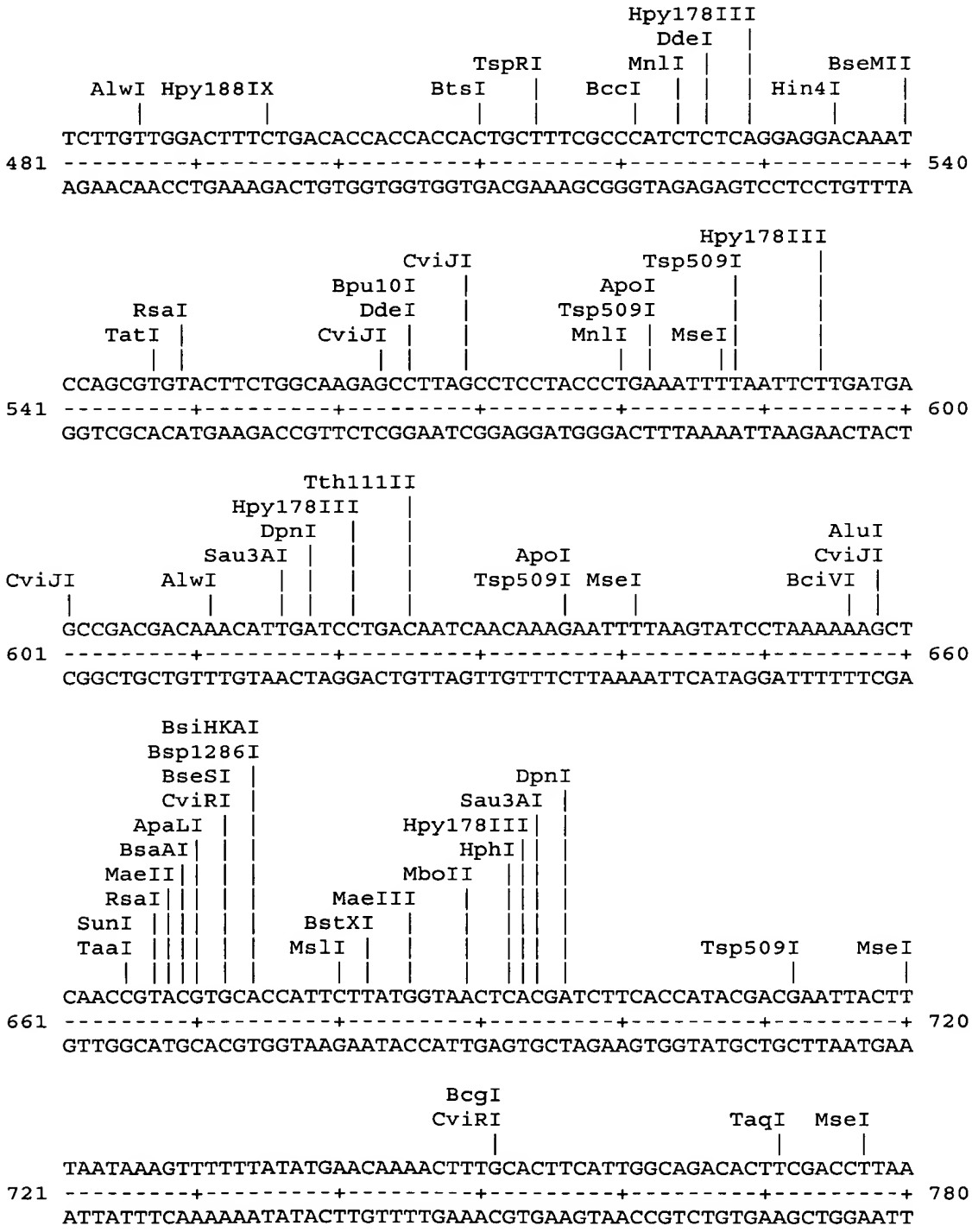


Figure 3D

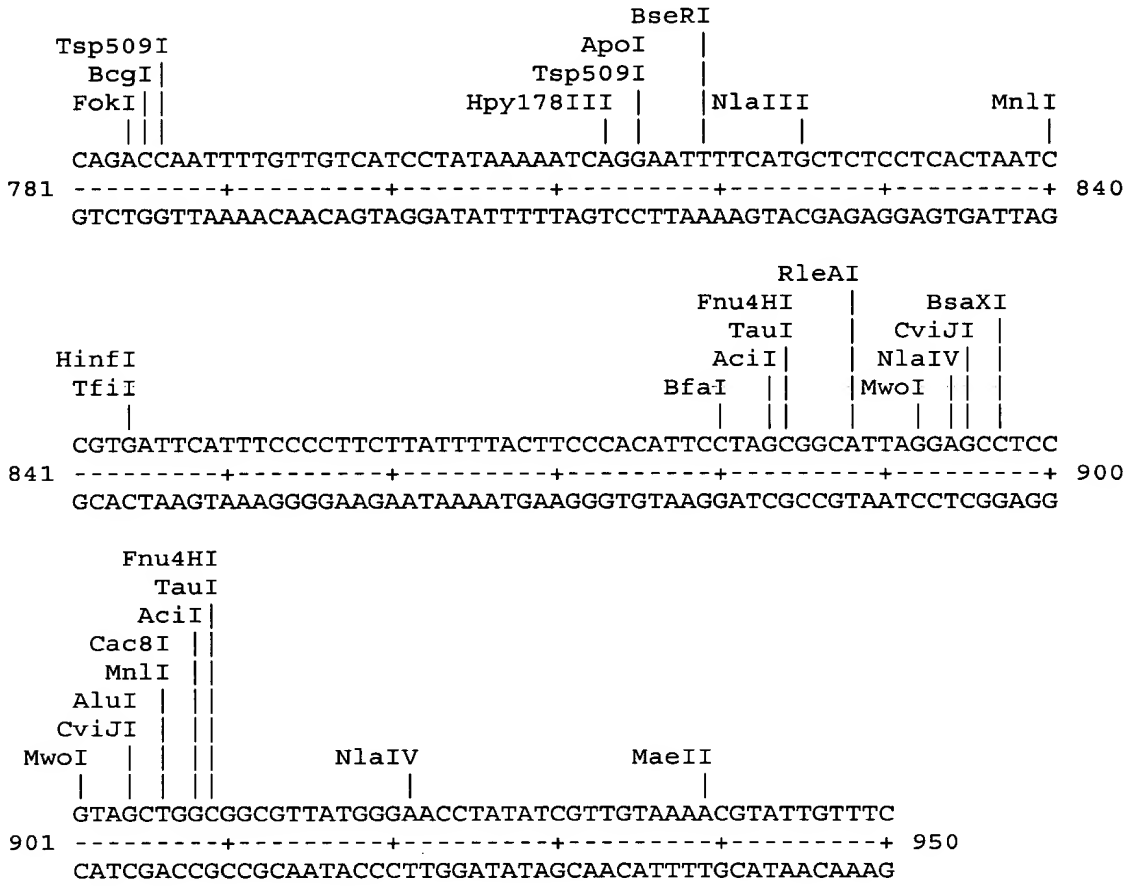


Figure 4A
Restriction enzyme analysis of CPN100710 (RY 58 - SEQ ID NO. 4)

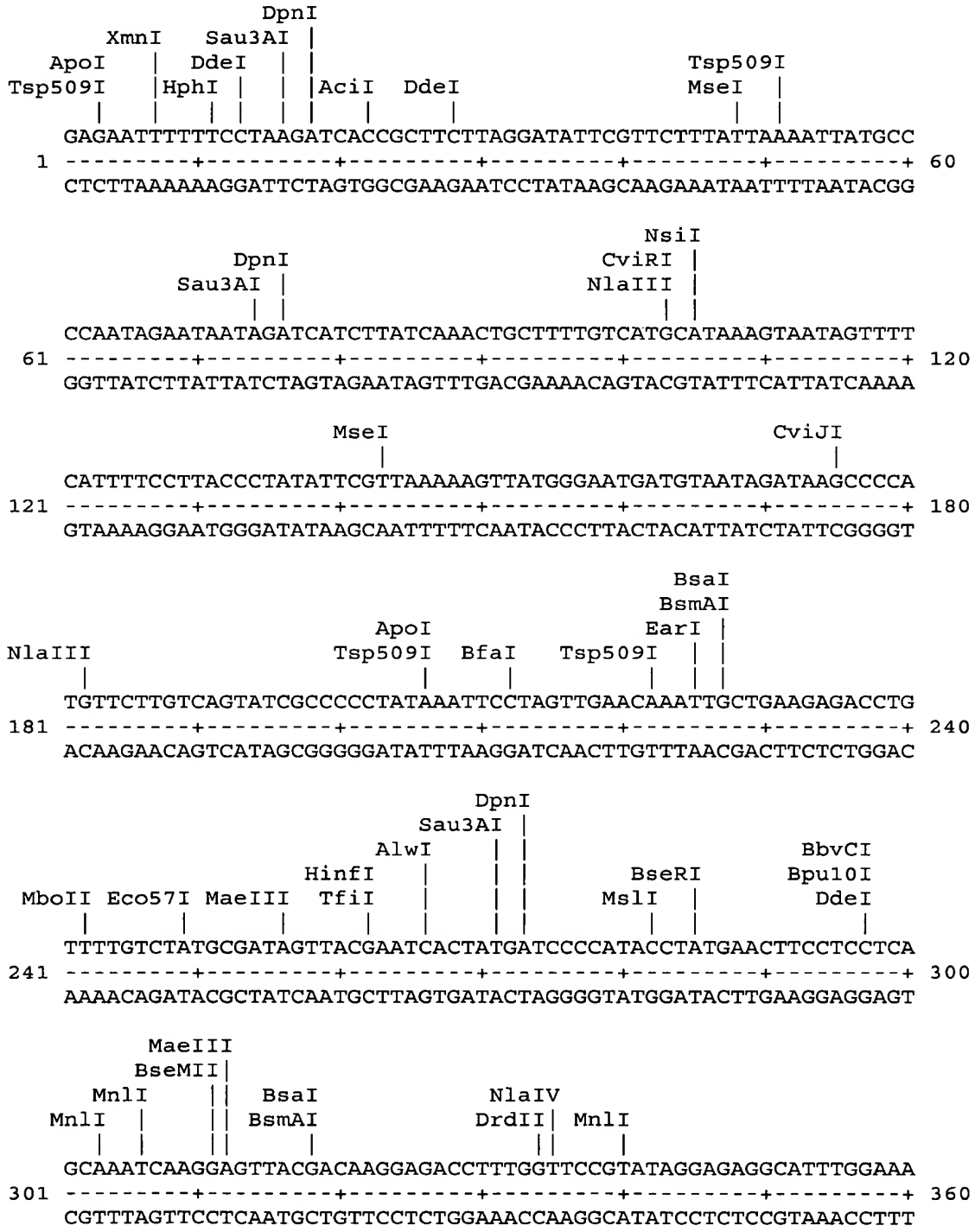


Figure 4B

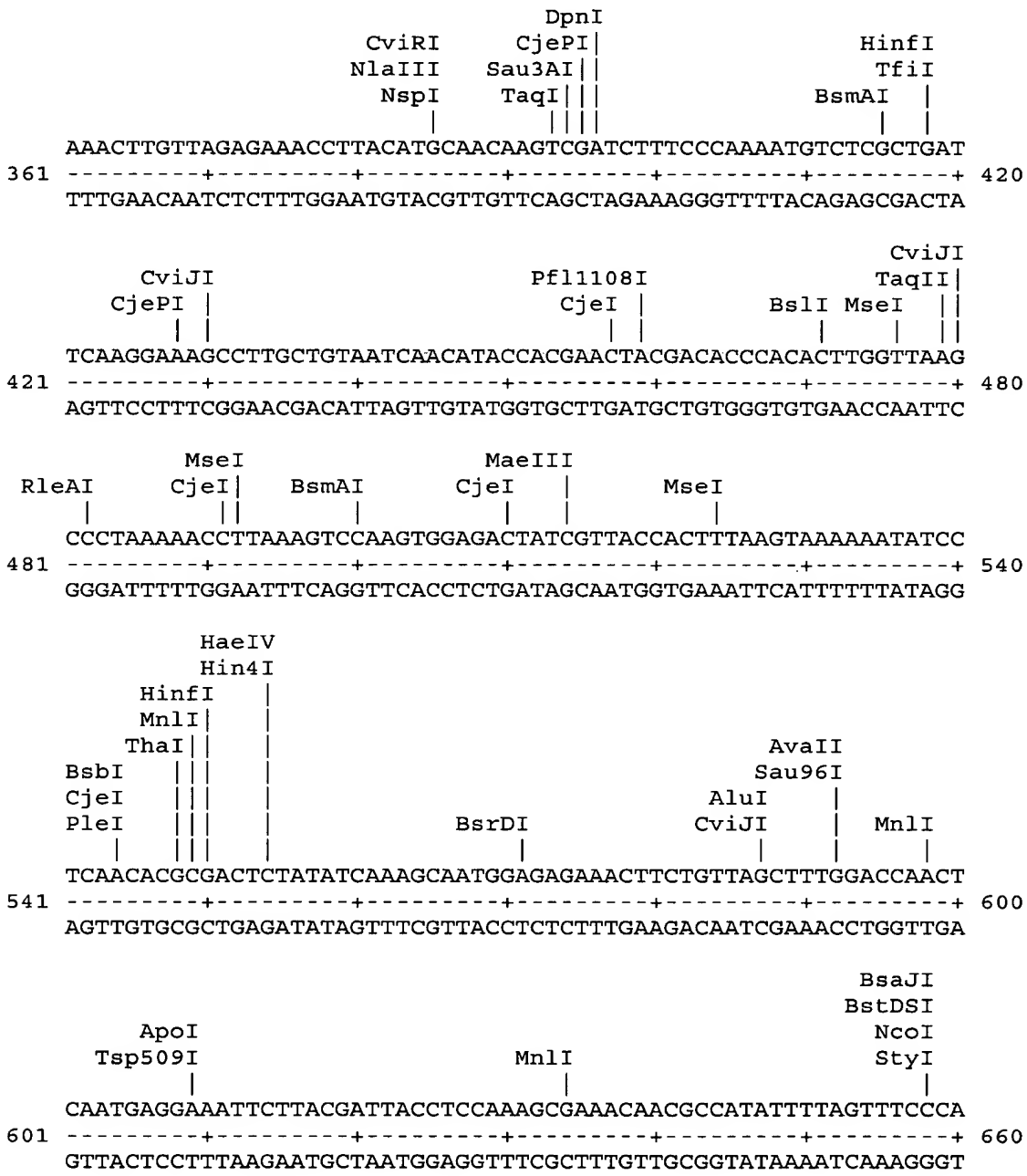
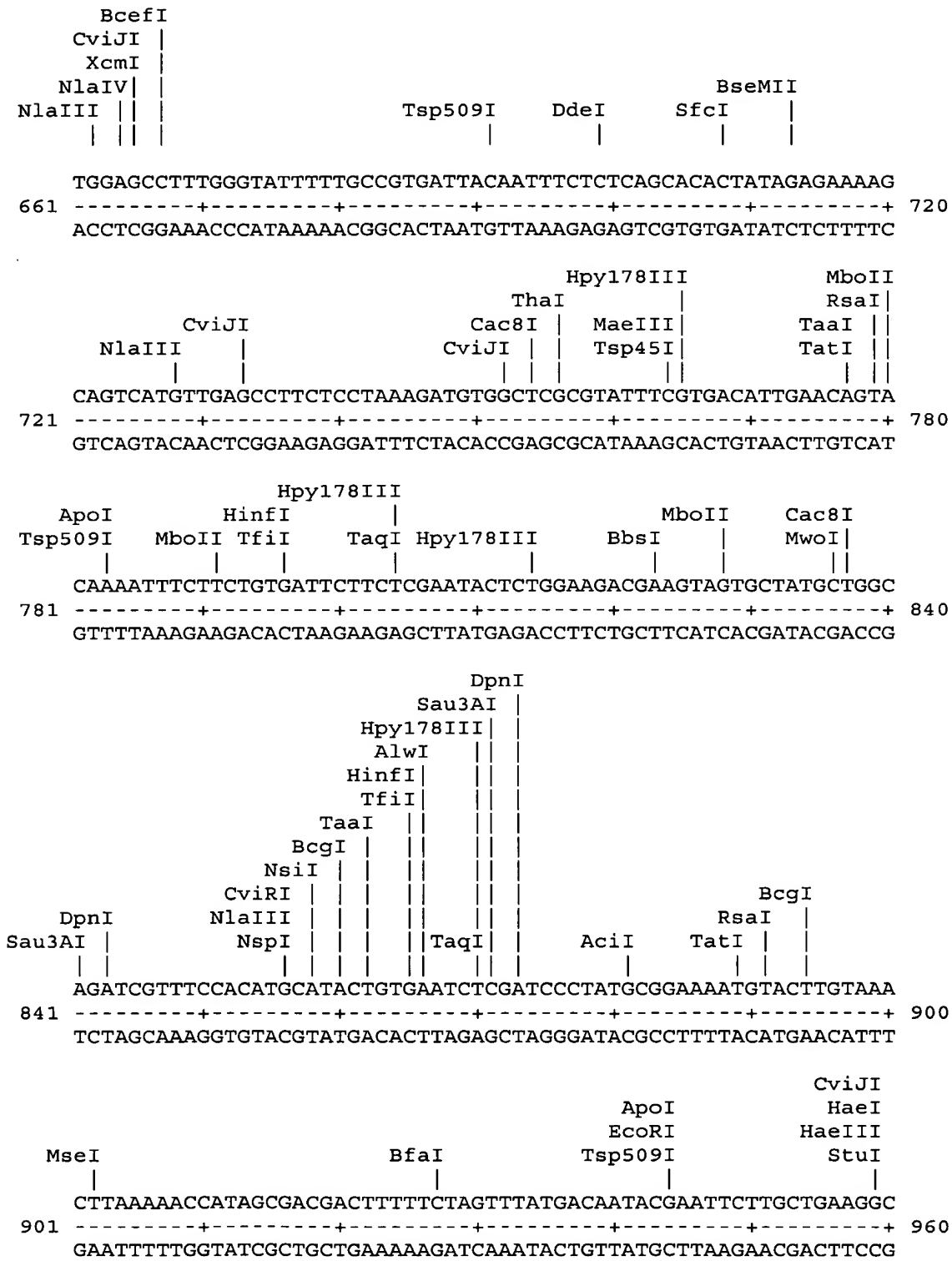


Figure 4C



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Inventor(s): Andrew D. MURDIN et al.
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Figure 4D

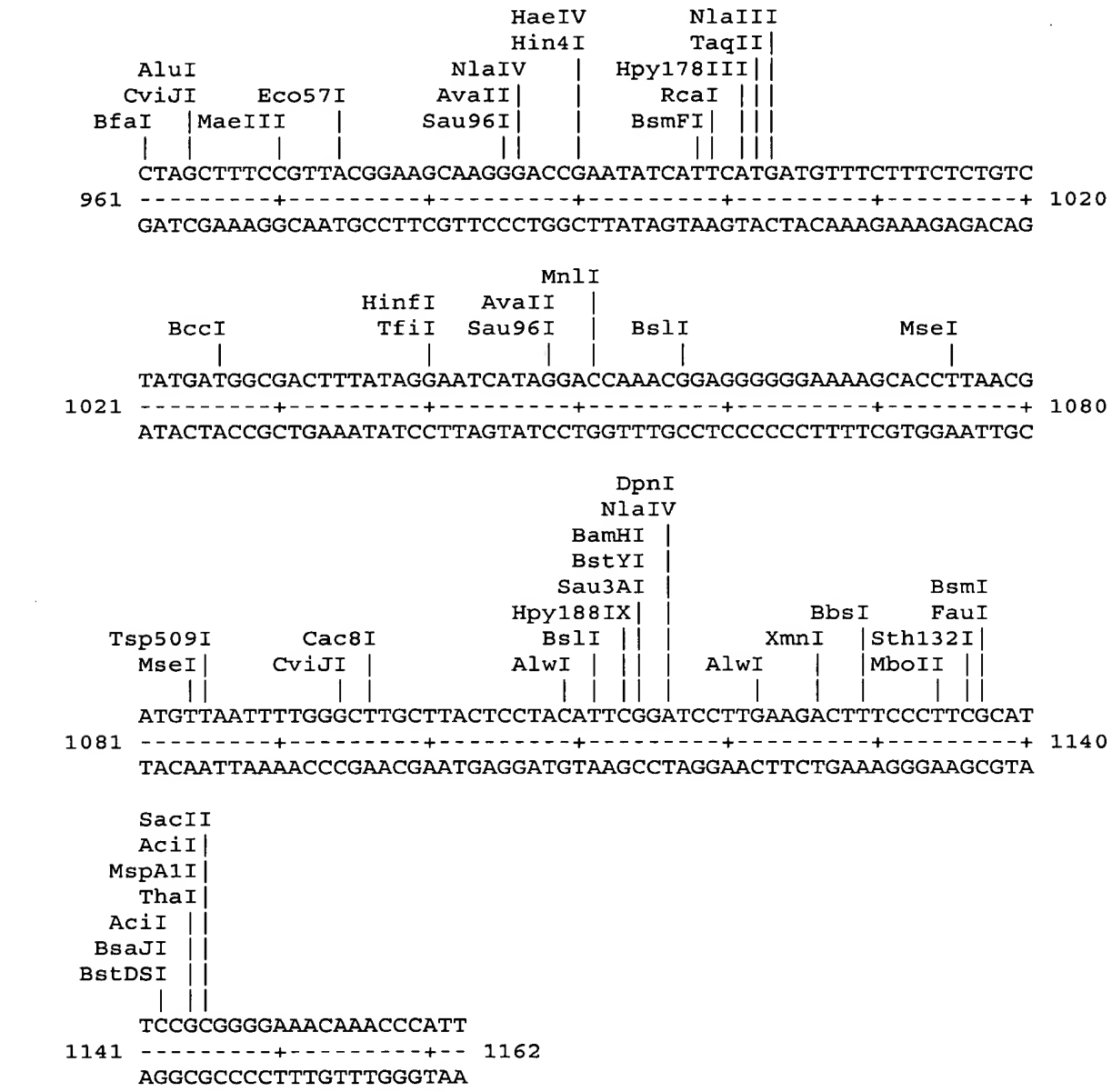
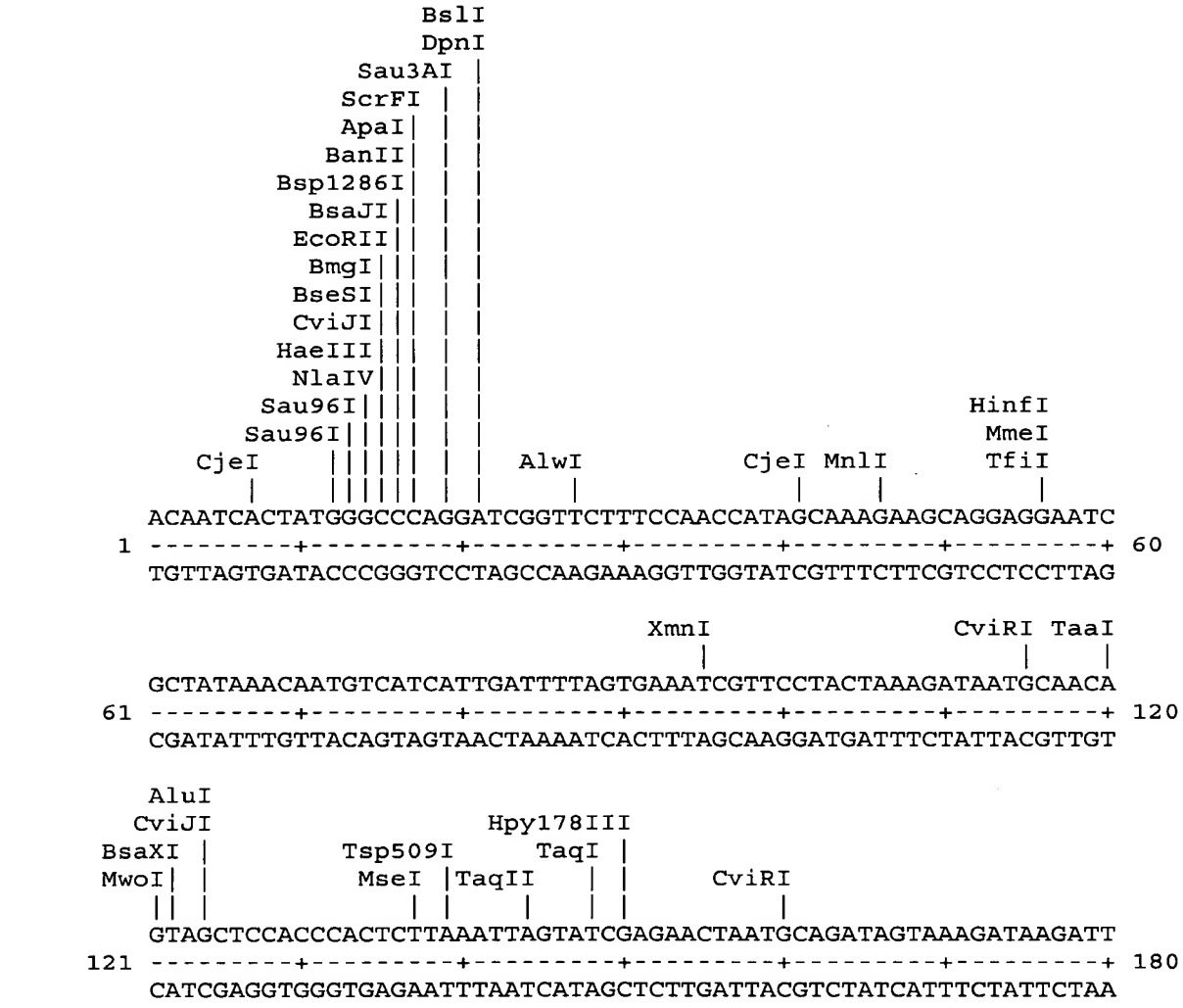


Figure 5A

Restriction enzyme analysis of CPN100711 (RY 59 - SEQ ID NO. 5)



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Inventor(s): Andrew D. MURDIN et al.
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Figure 5B

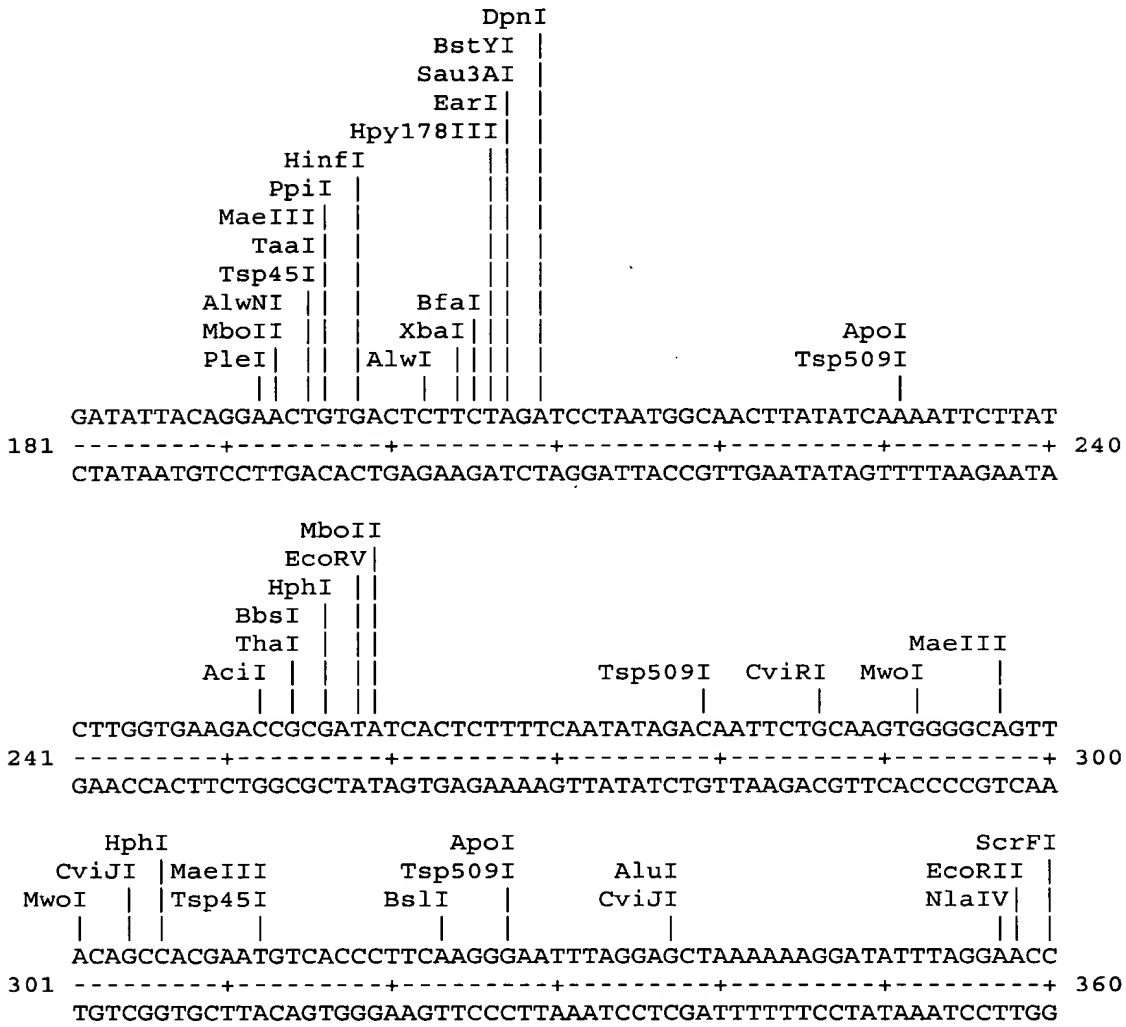


Figure 5C

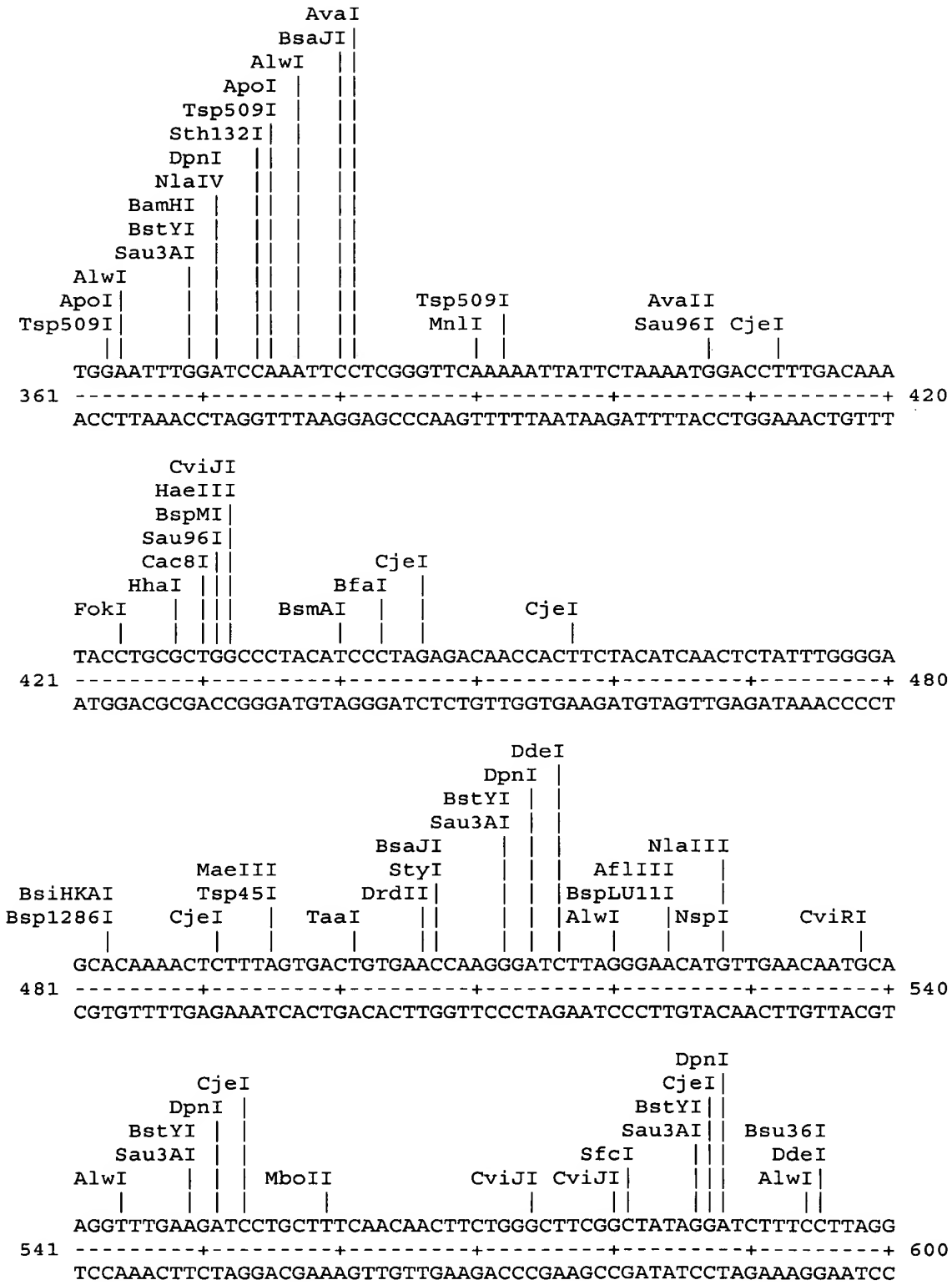


Figure 5D

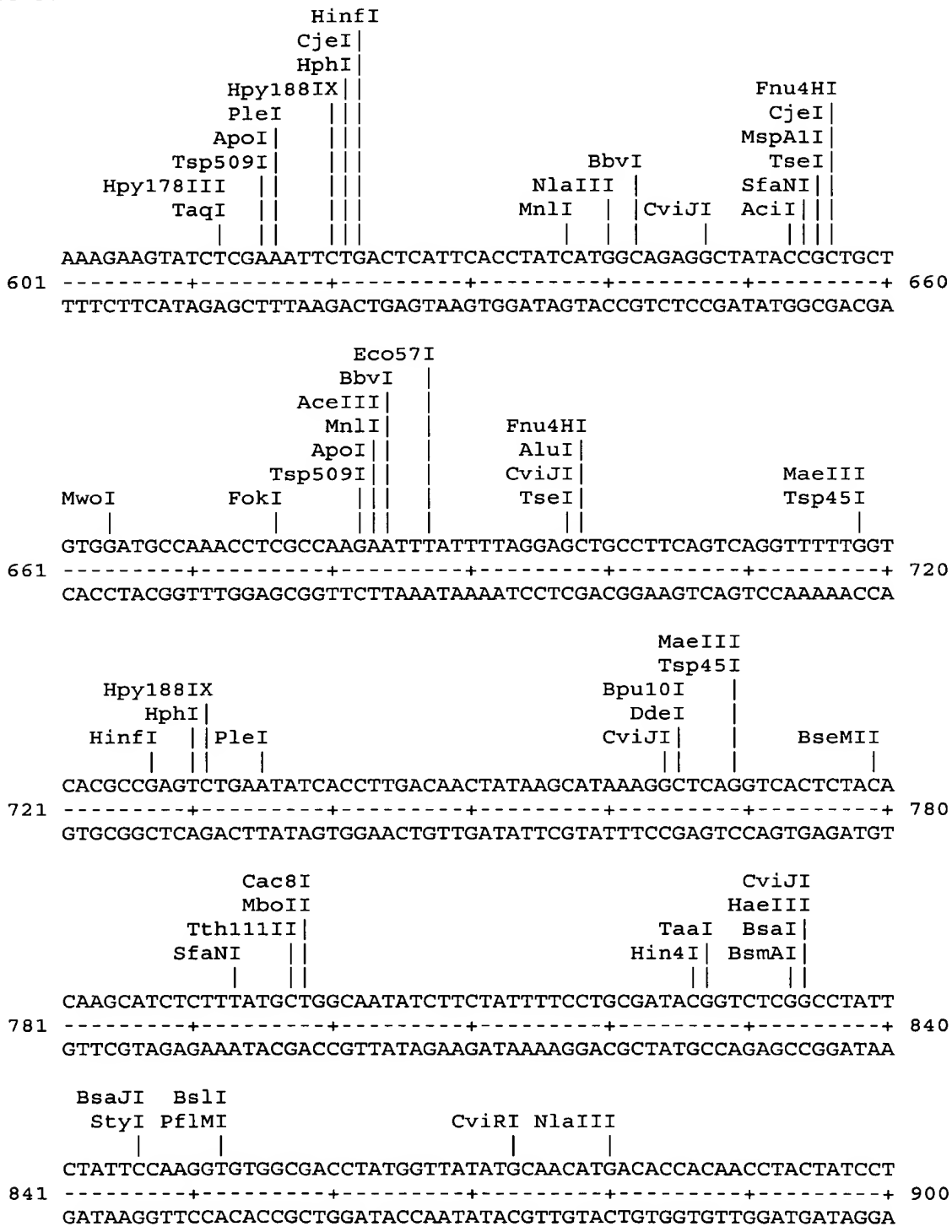


Figure 5E

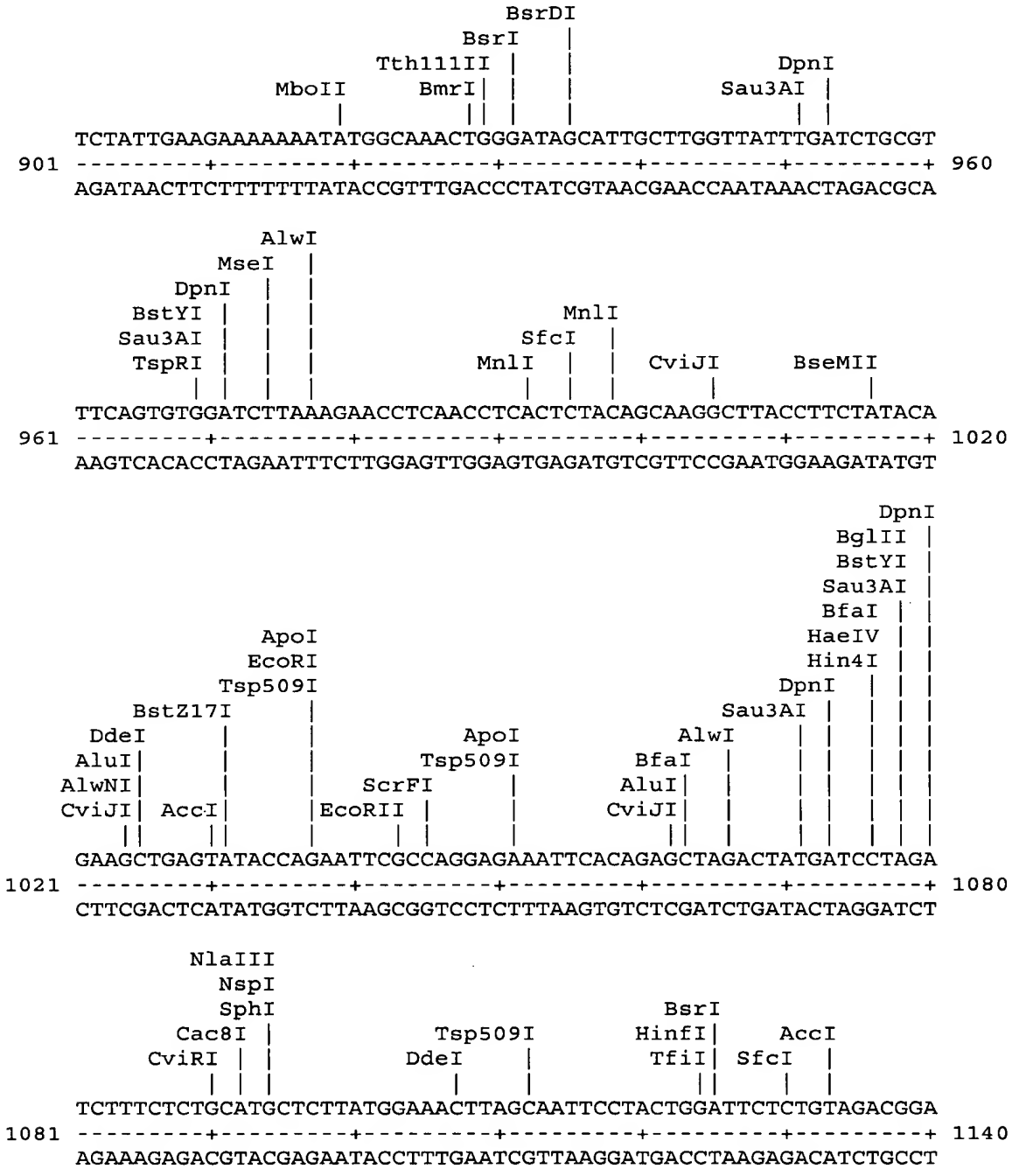


Figure 5F

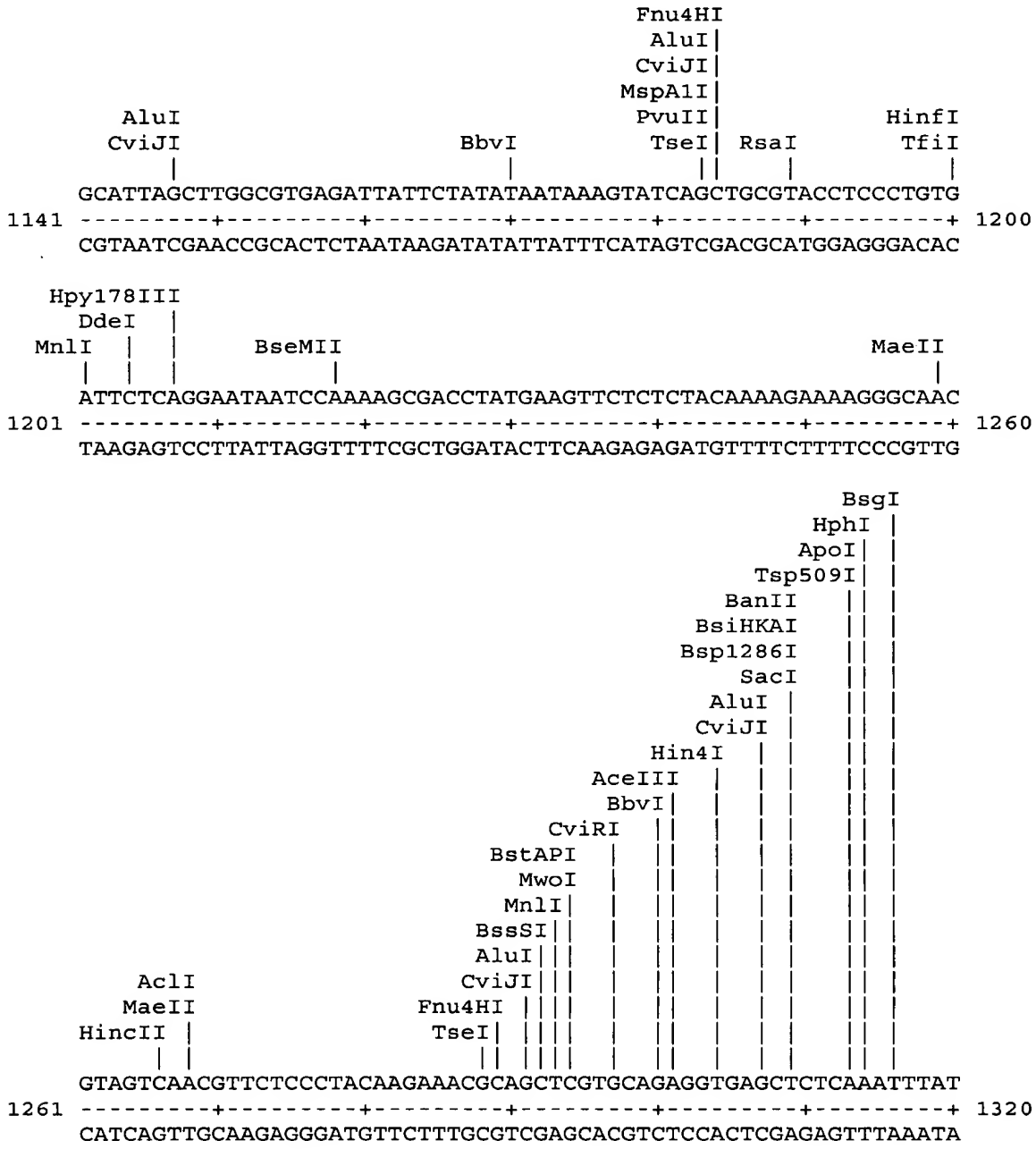
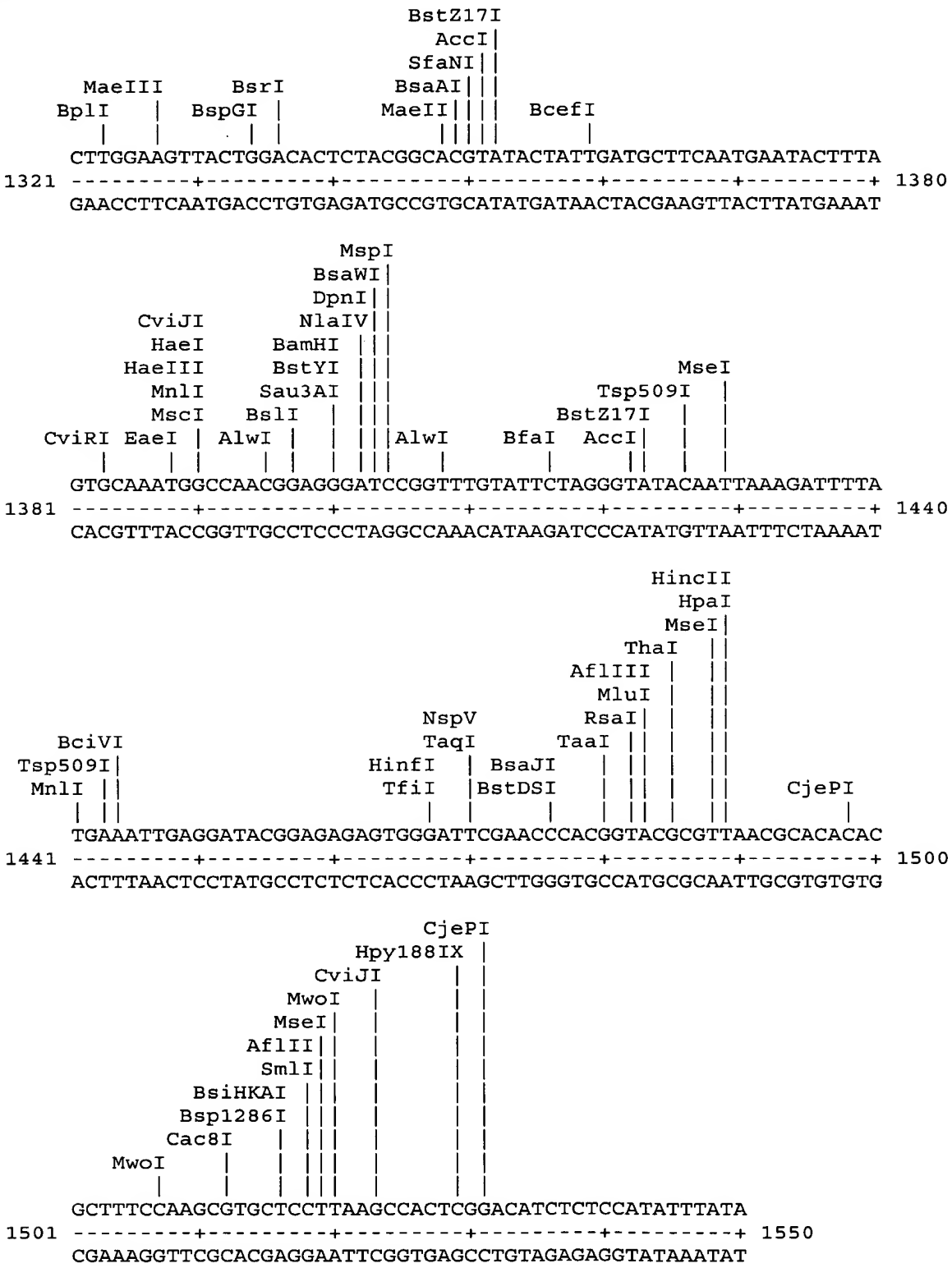


Figure 5G



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Inventor(s): Andrew D. MURDIN et al.
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Figure 6A

Restriction enzyme analysis of CPN100877 (RY 61 - SEQ ID NO. 6)

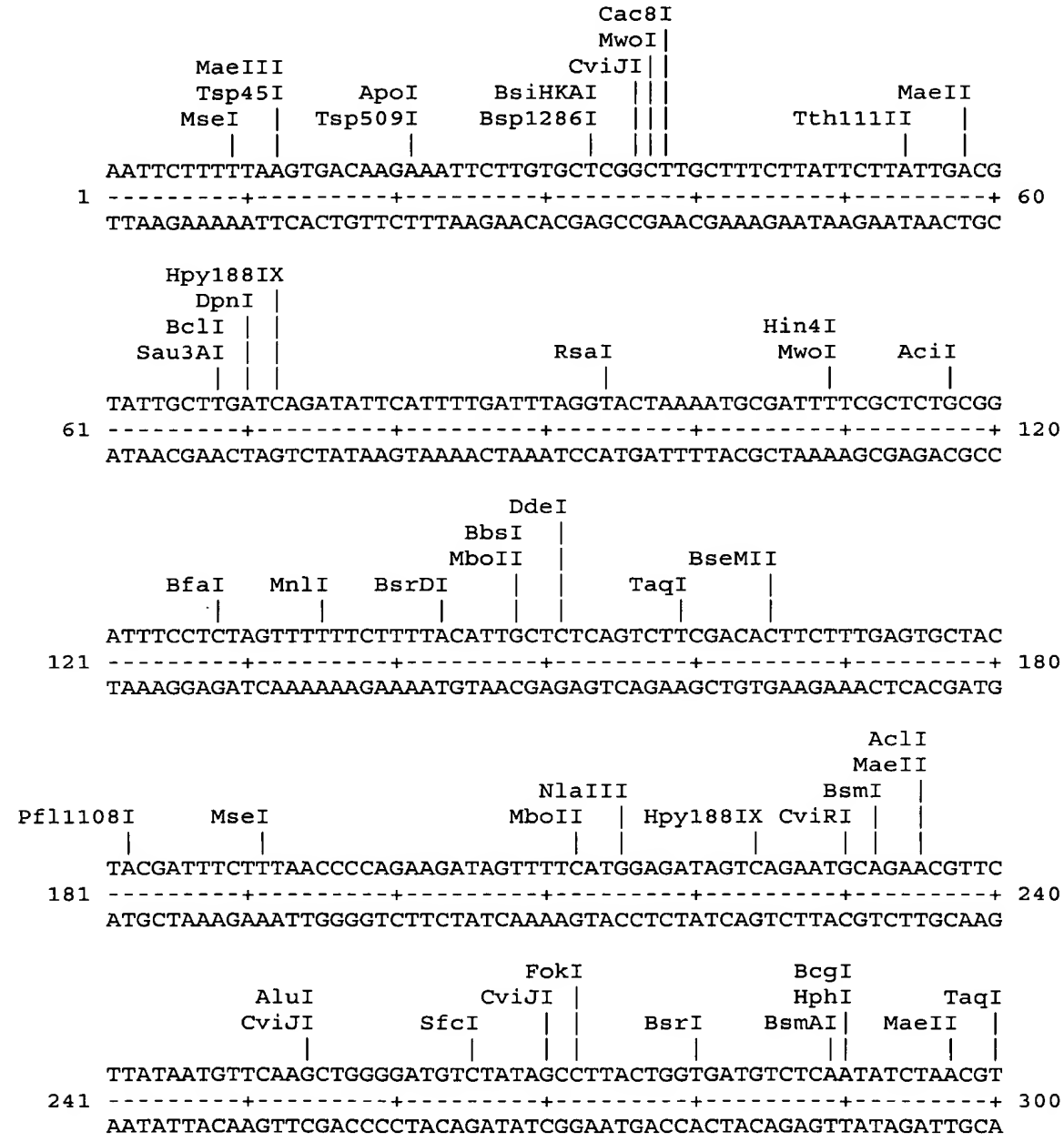

Figure 6B

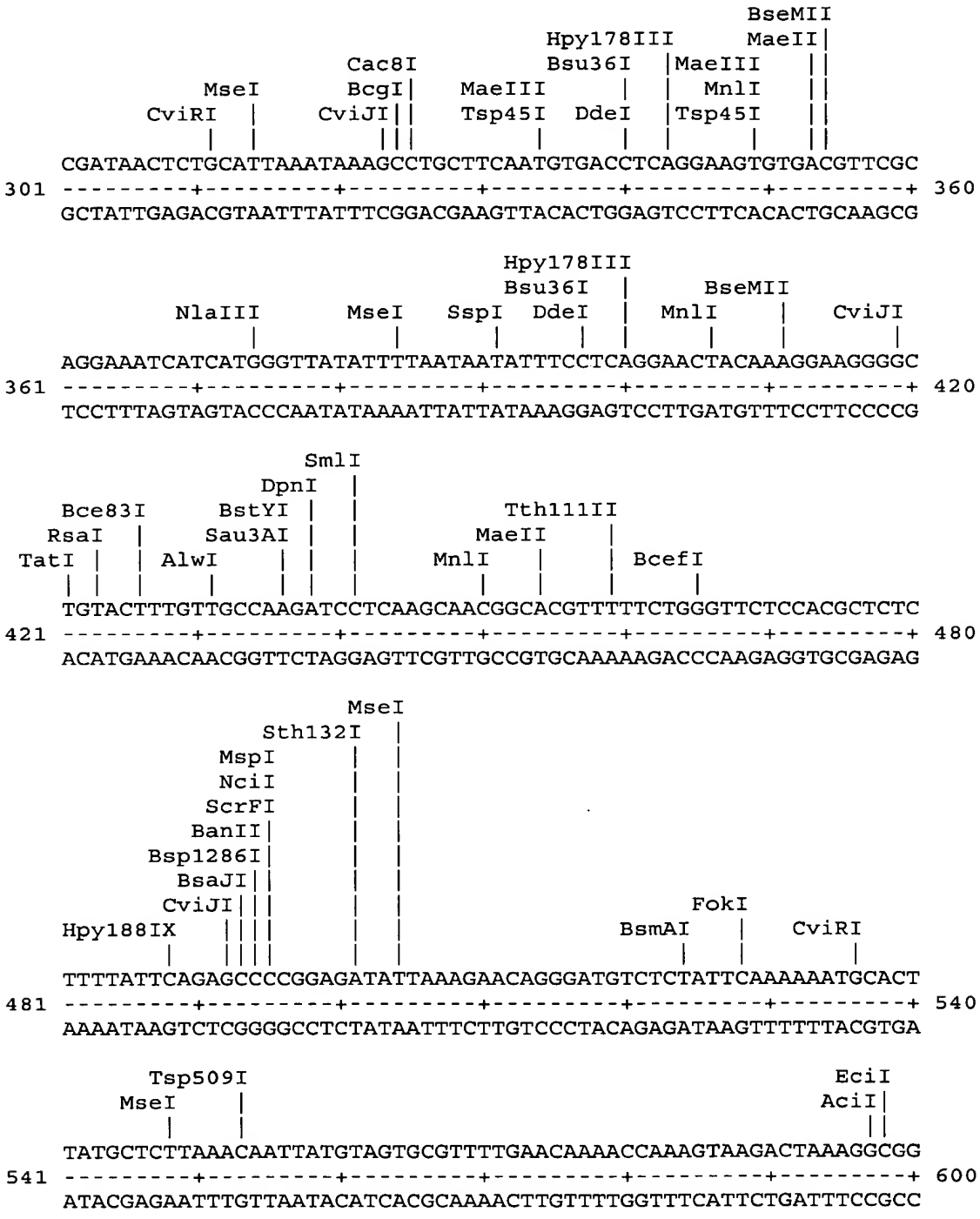

Figure 5C

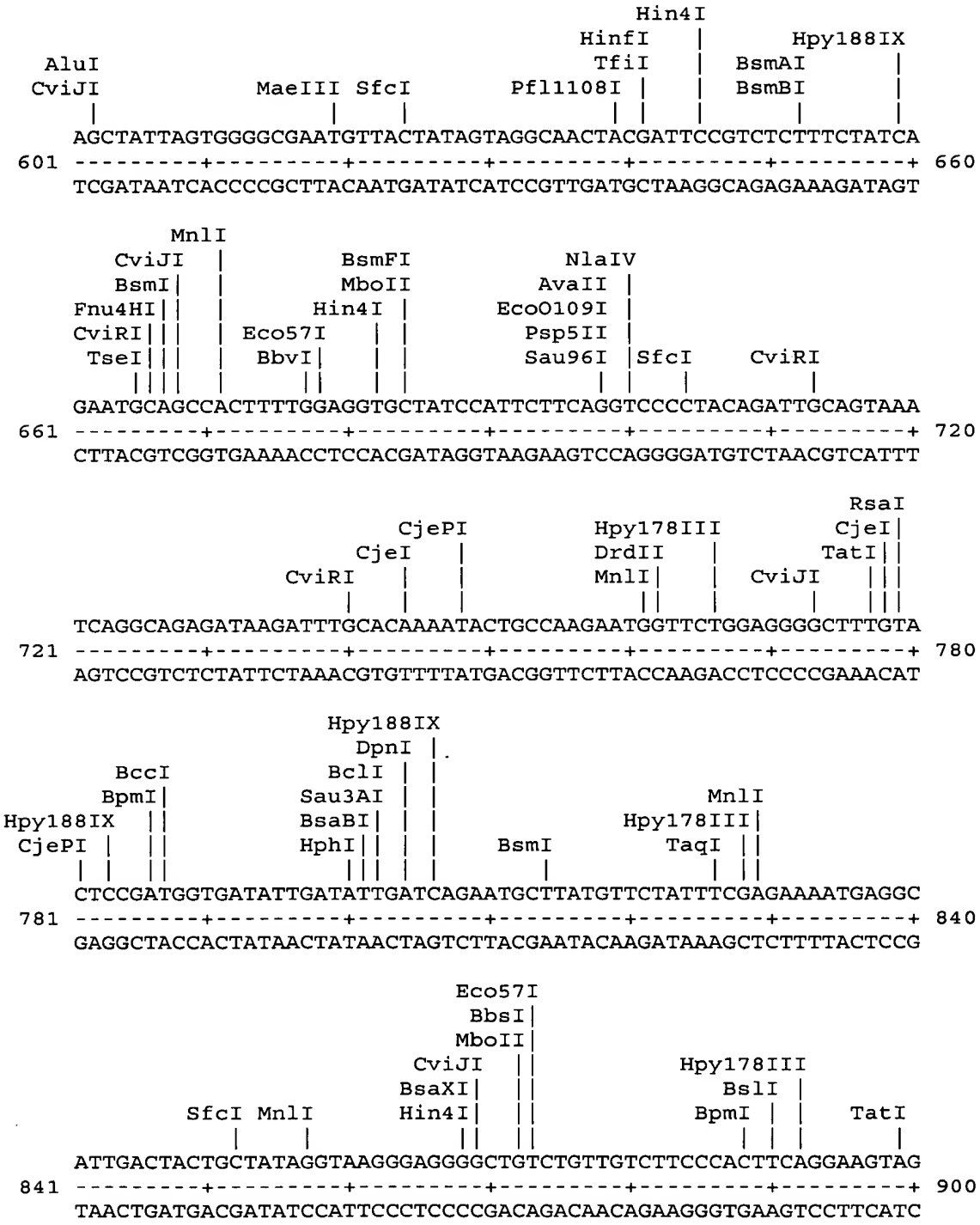

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Figure 6D

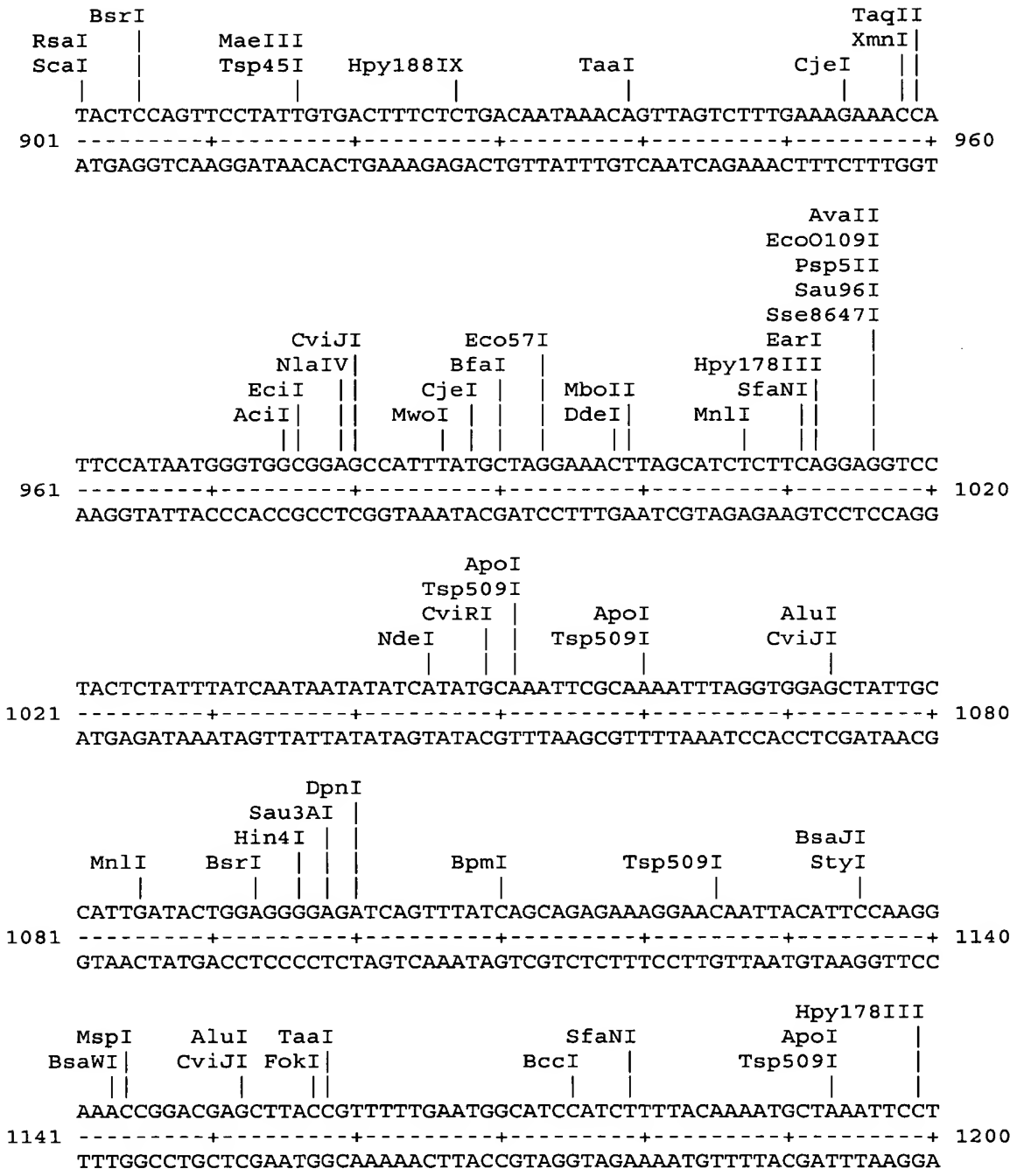

Figure 6E

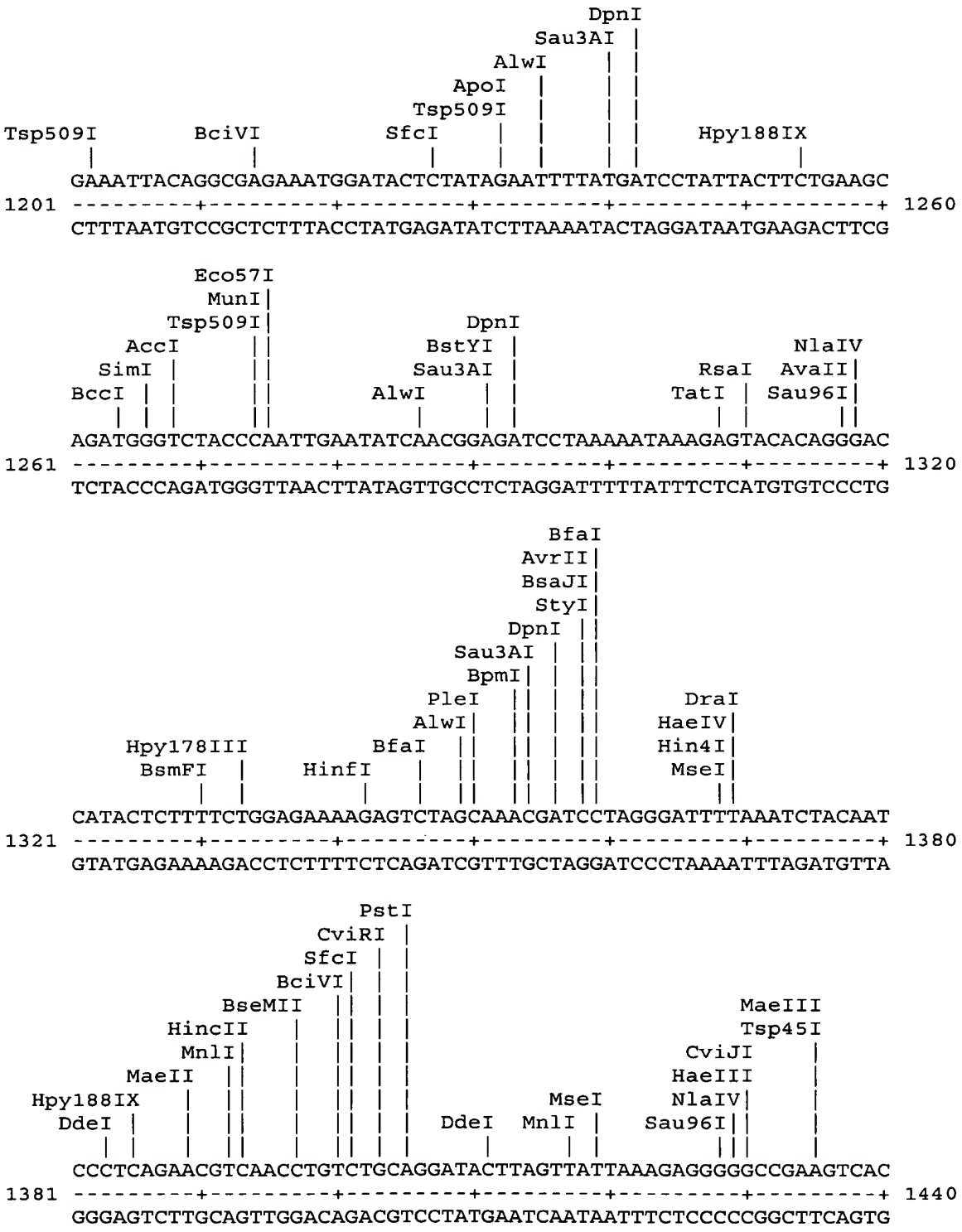

Figure 6F

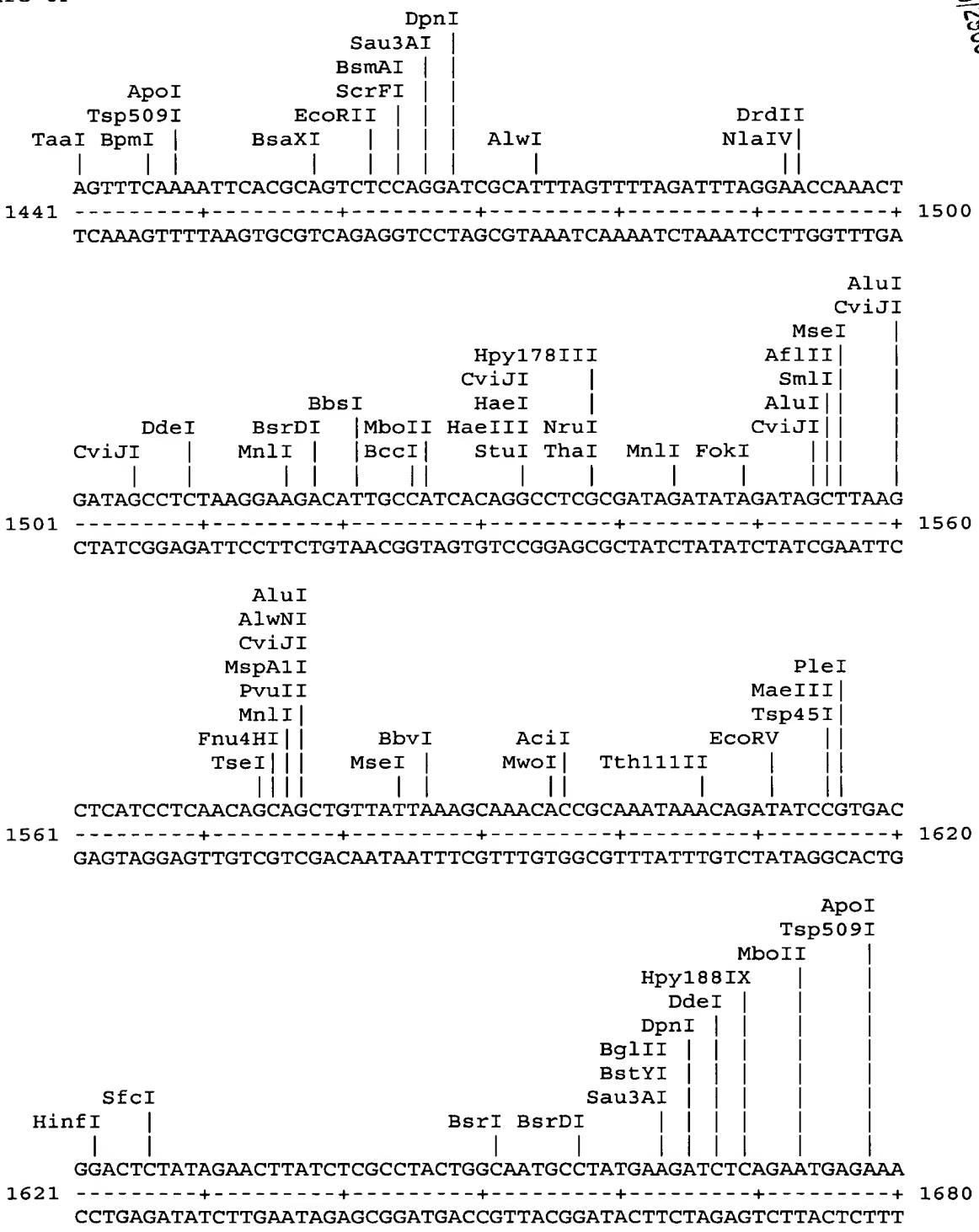

Figure 6G

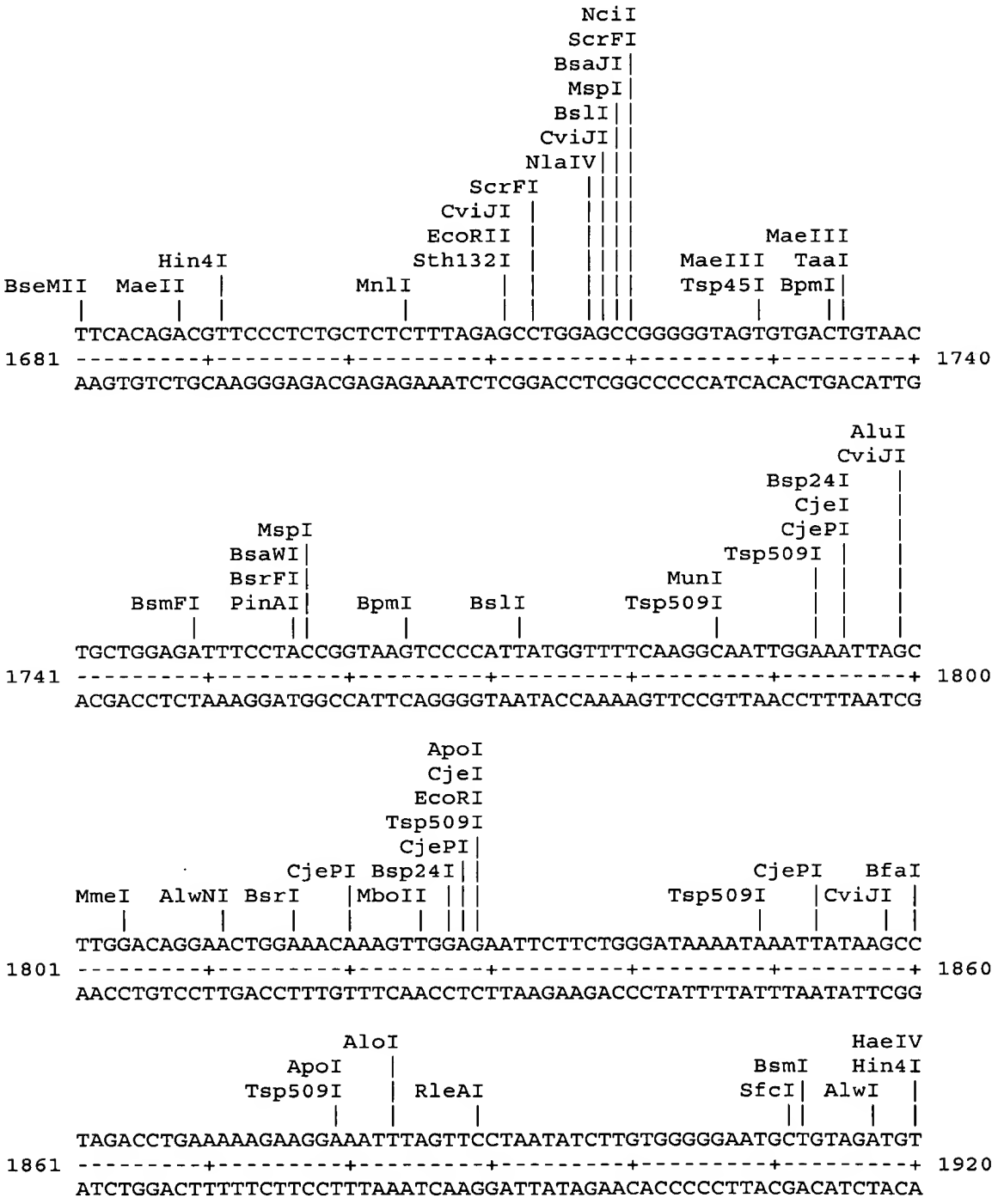

Figure 6H

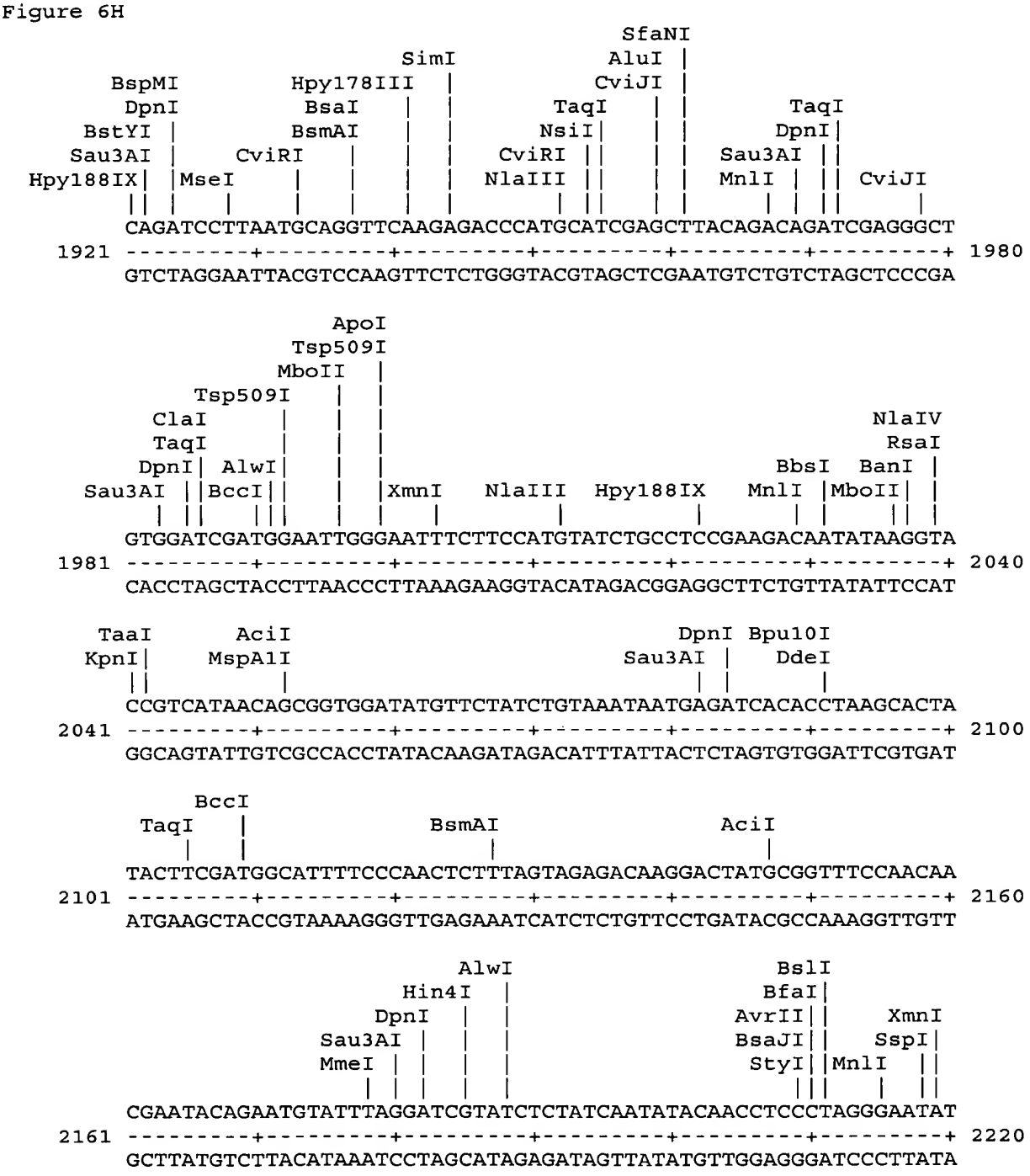

Figure 6I

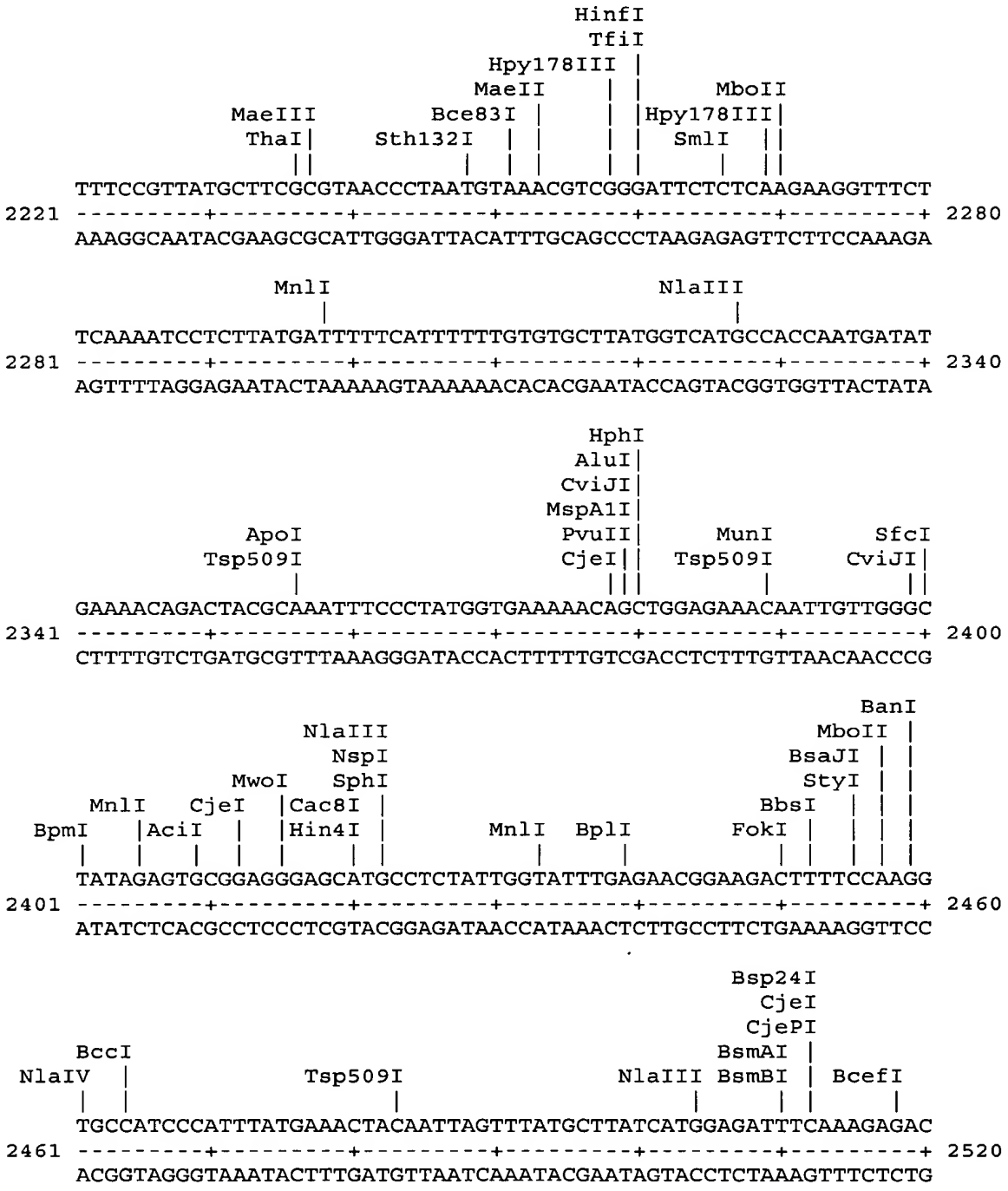

Figure 6J

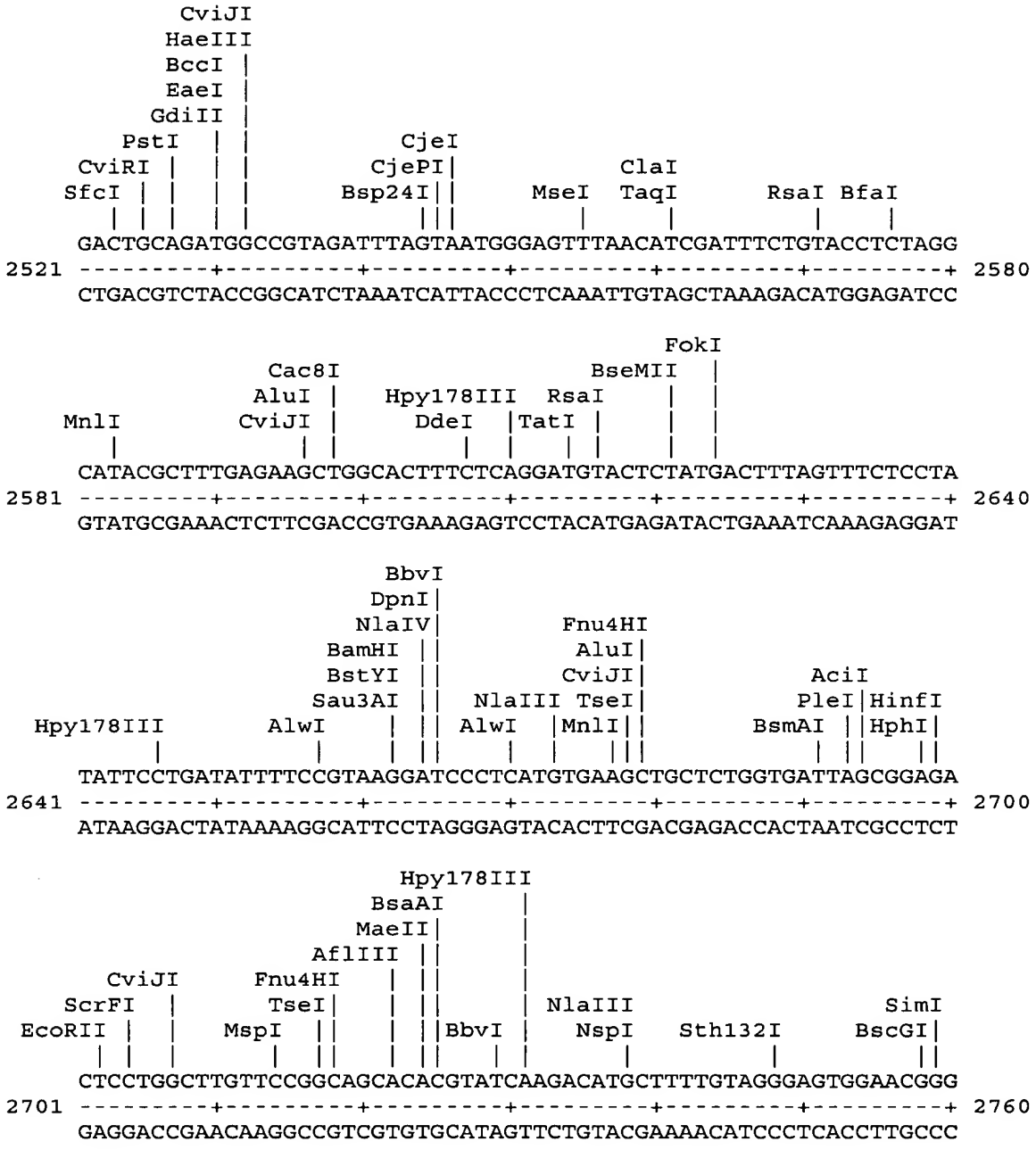

Figure 6K

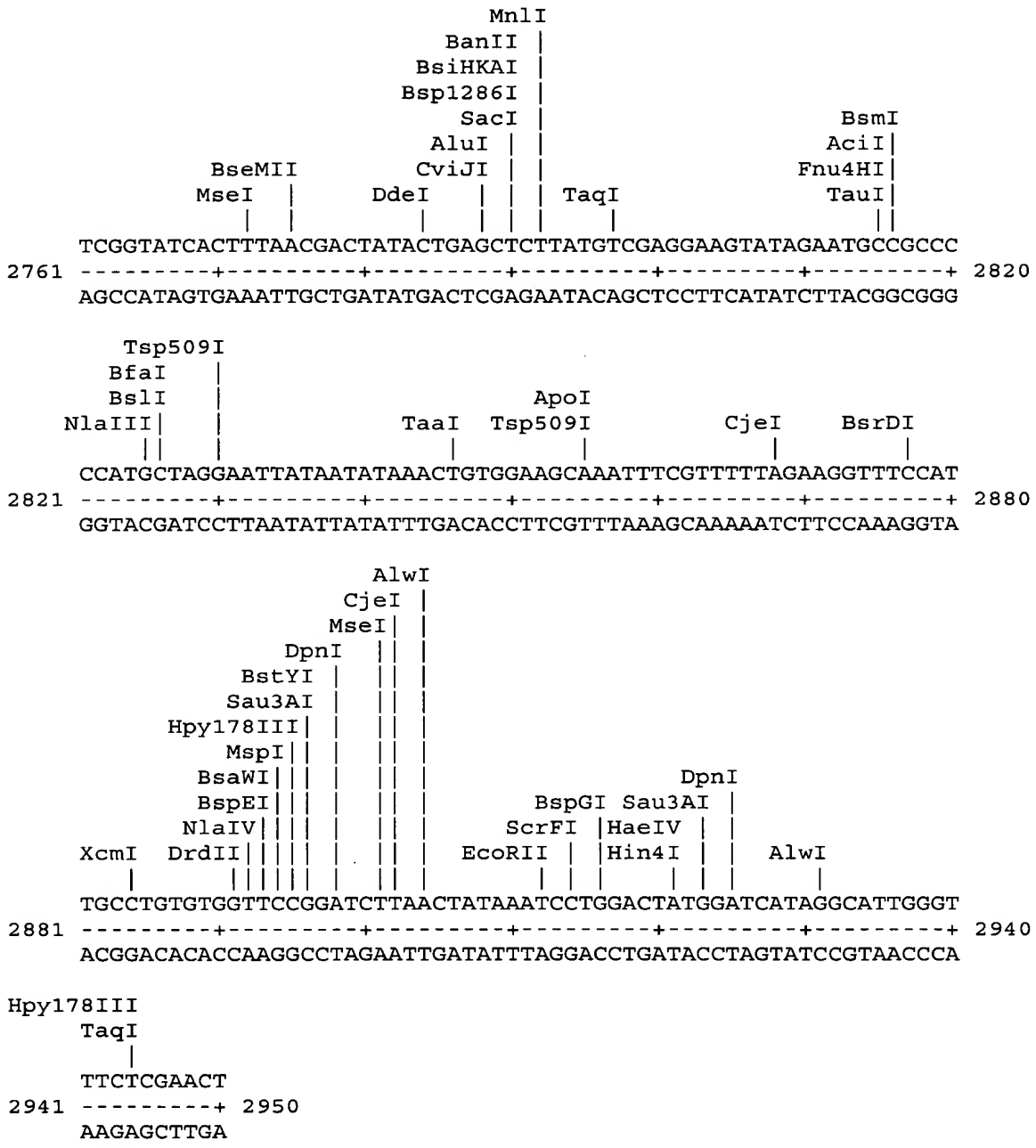

Figure 7A

Restriction enzyme analysis of CPN100325 (RY 62 - SEQ ID NO. 7)

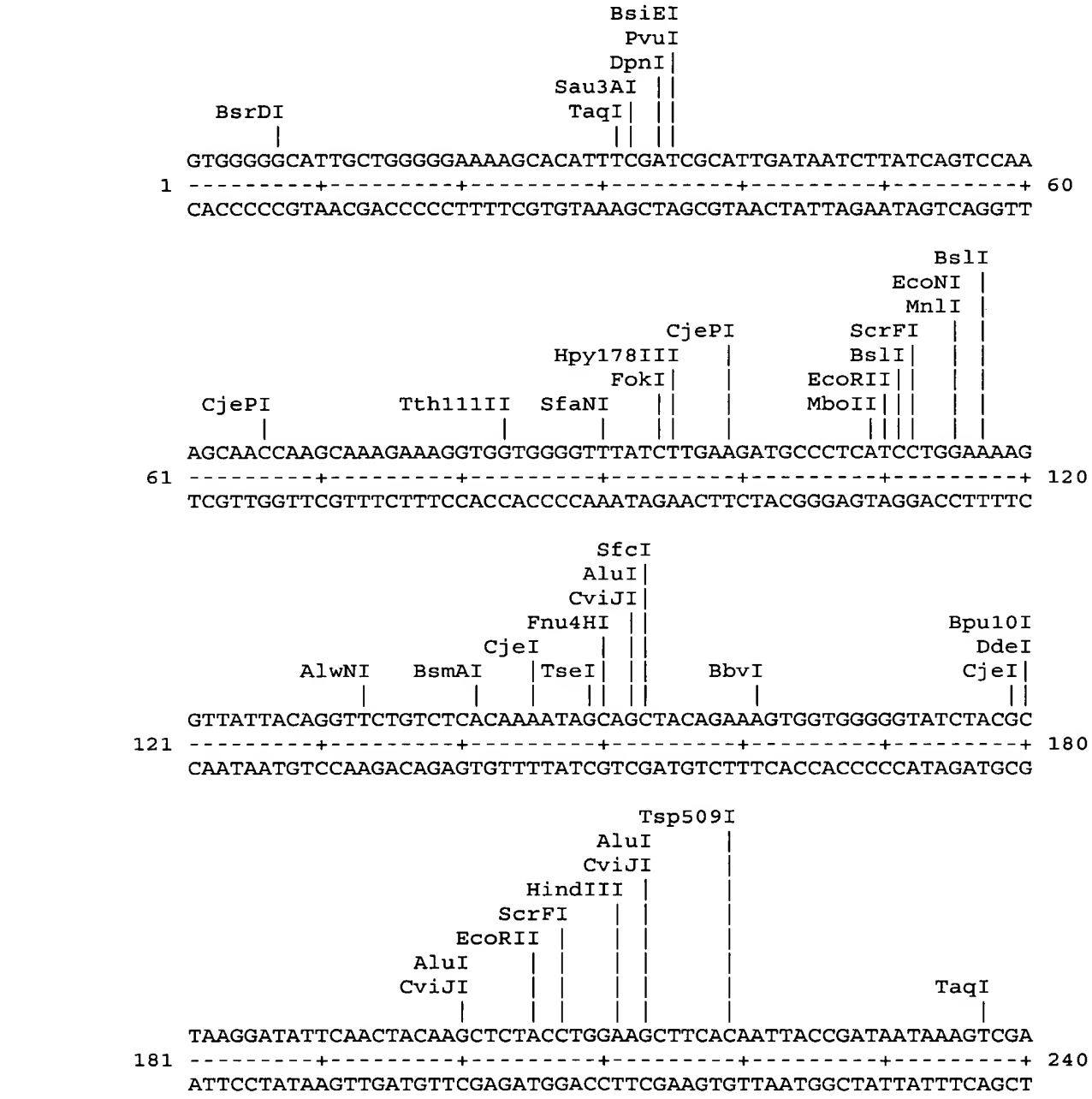

Figure 7B

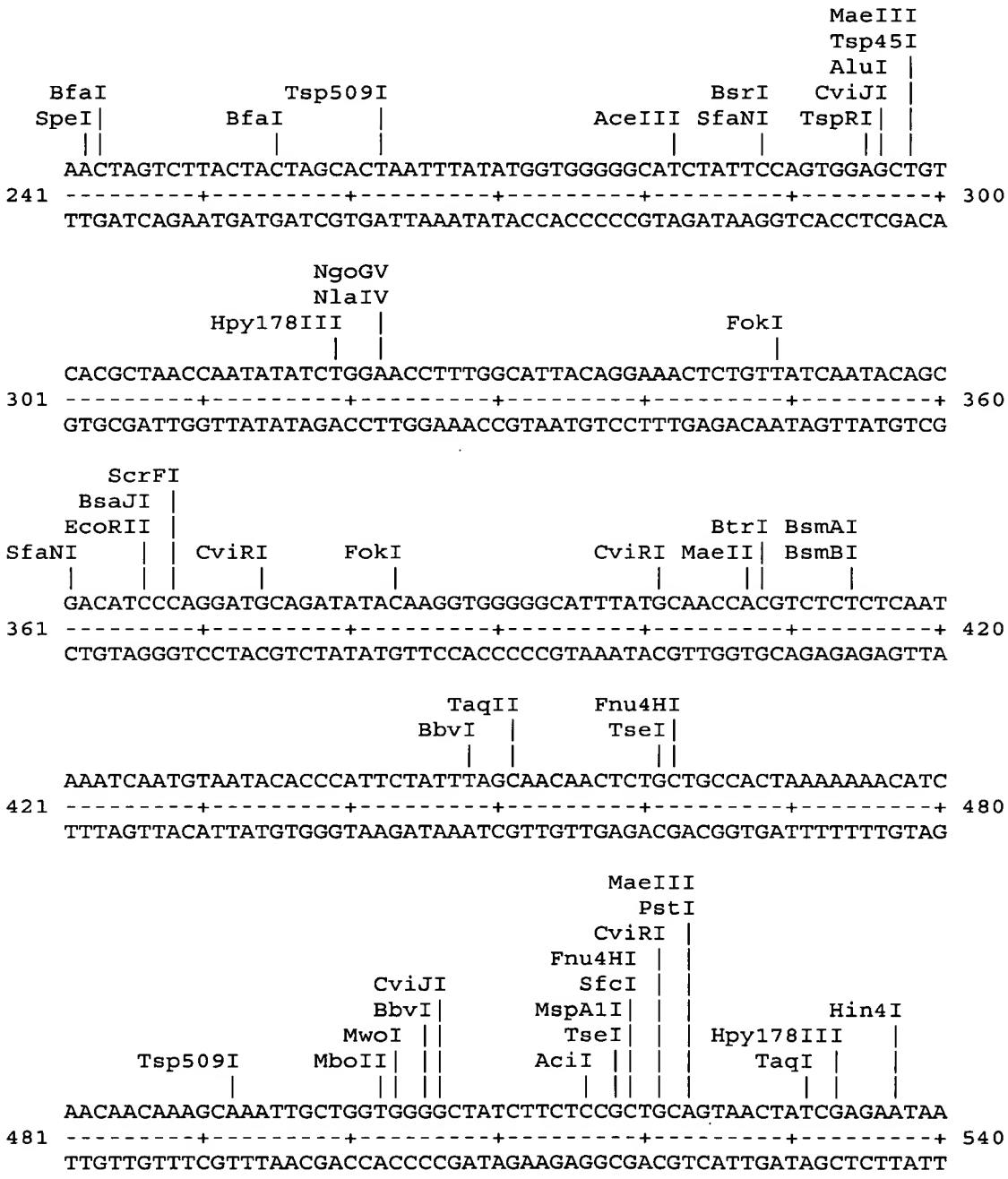

Figure 7C

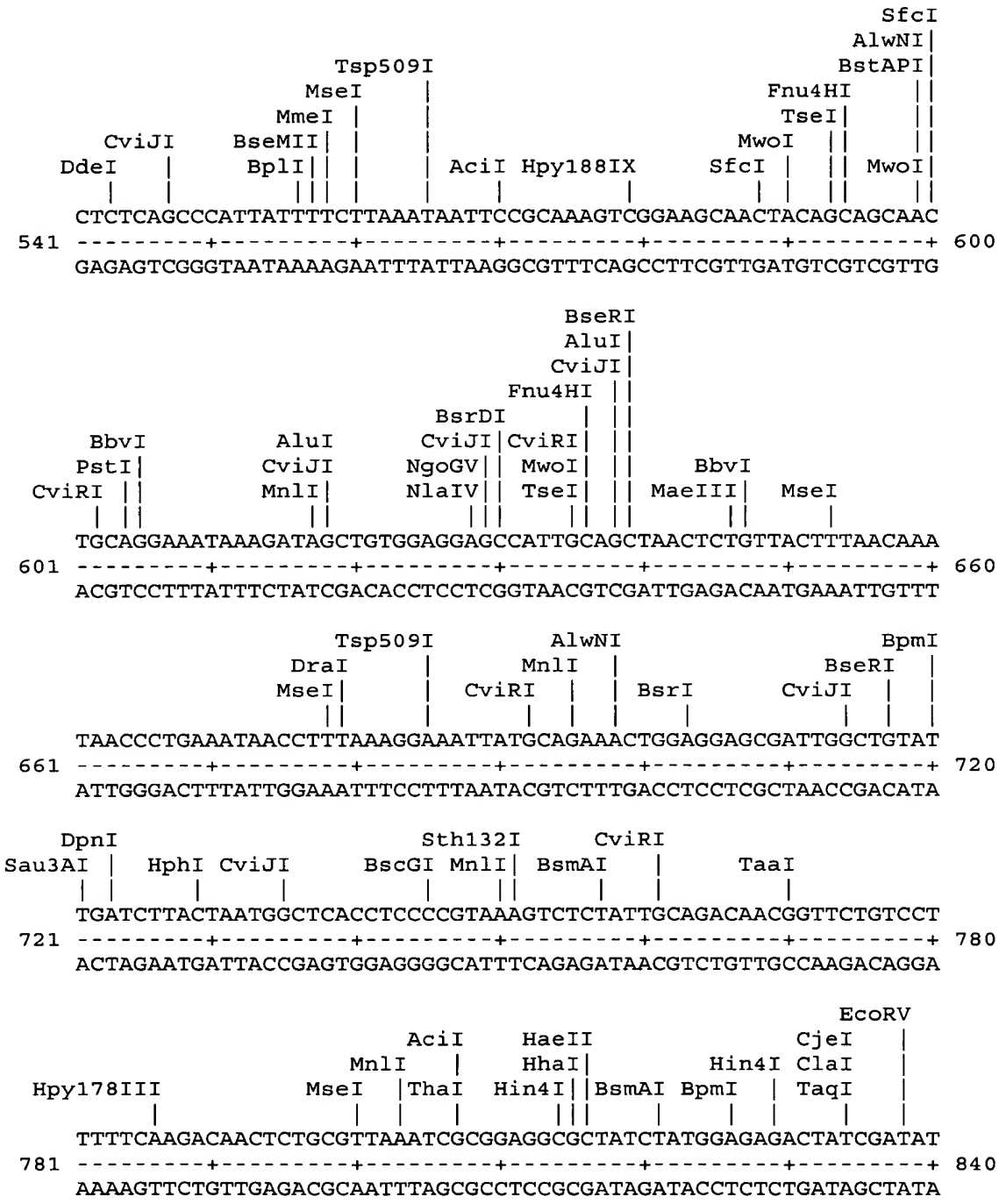

Figure 7D

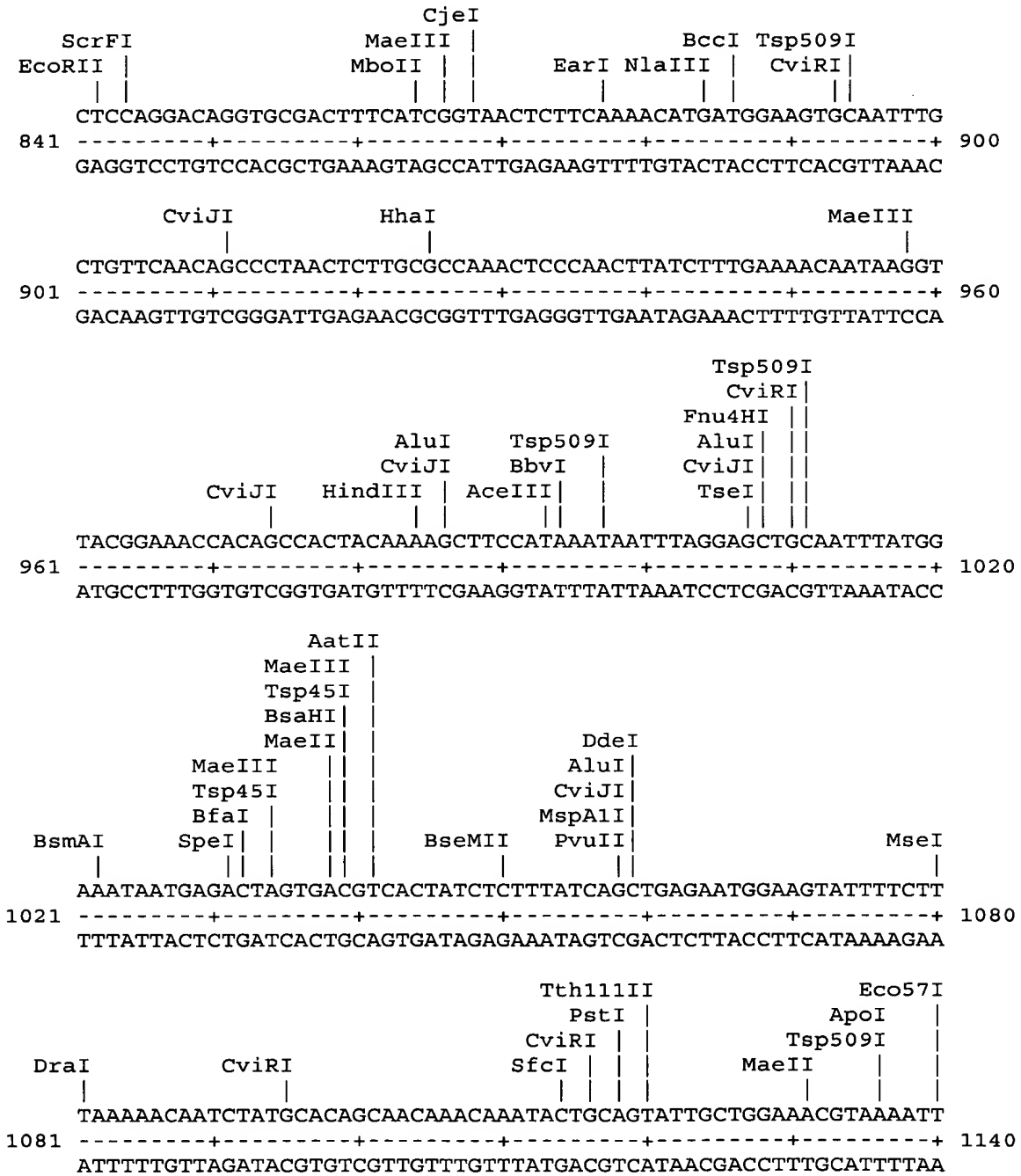

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Figure 7E

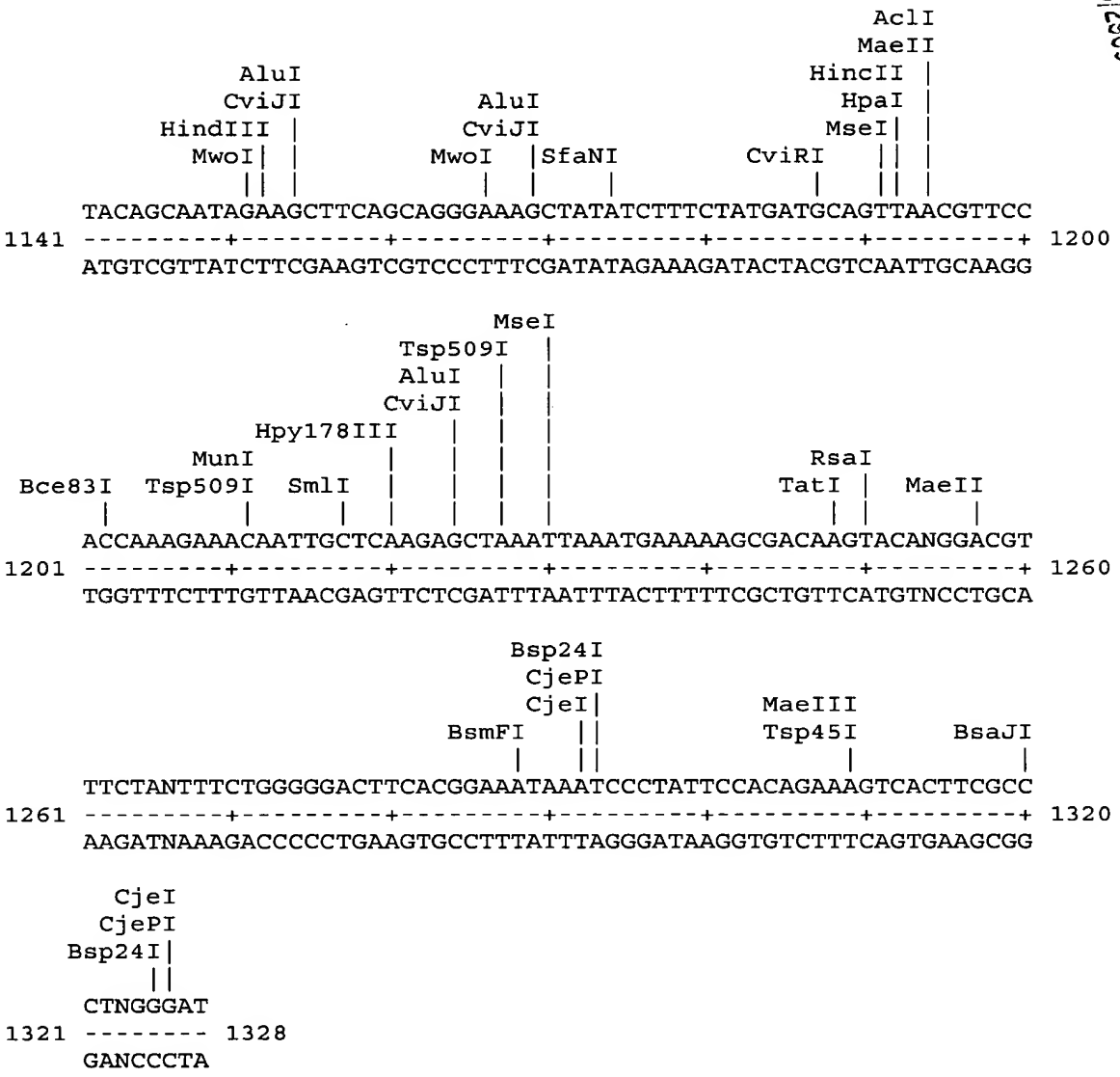

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Figure 8A

Restriction enzyme analysis of CPN100368 (RY 63 - SEQ ID NO. 8)

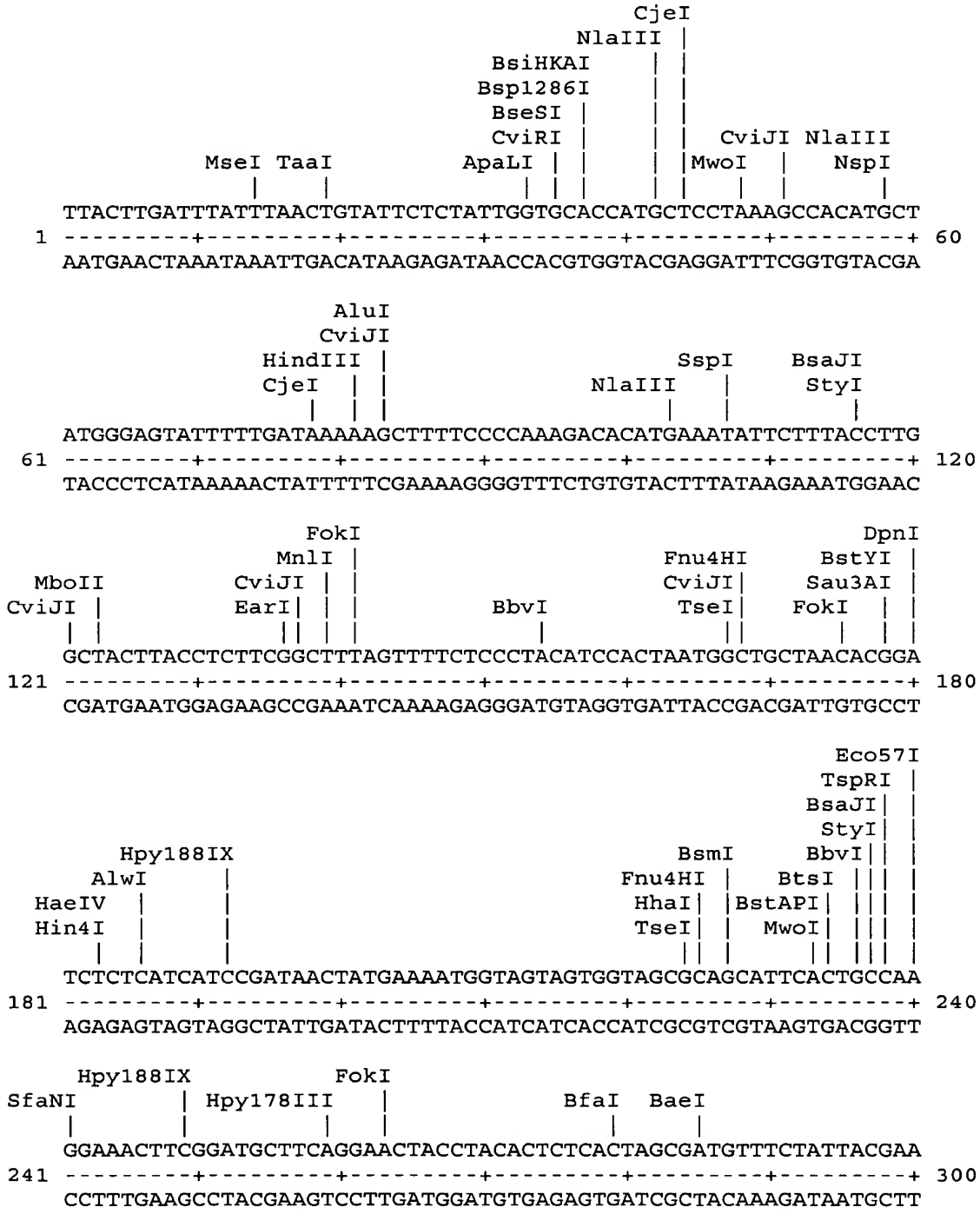

Figure 8B

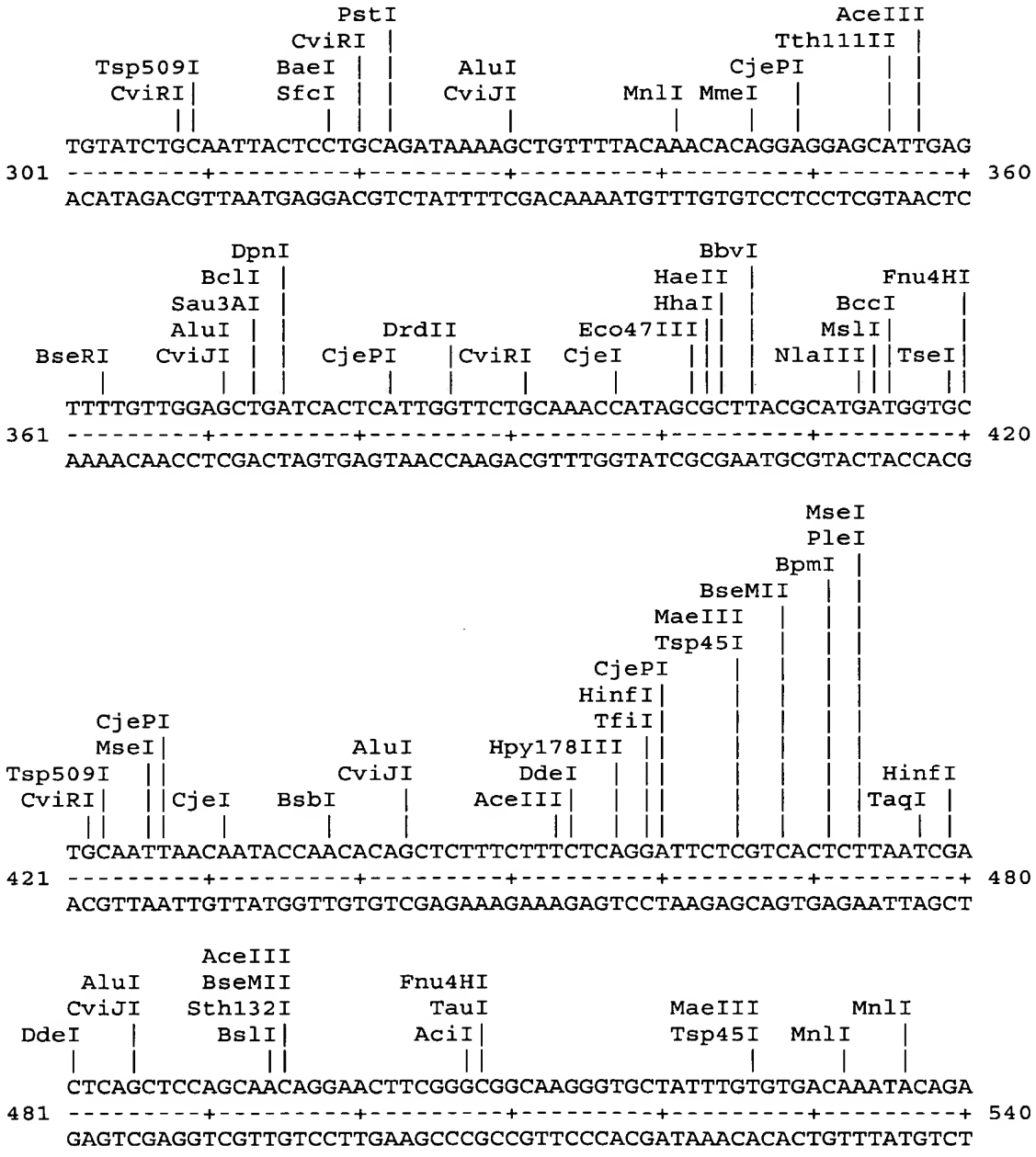

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Figure 8C

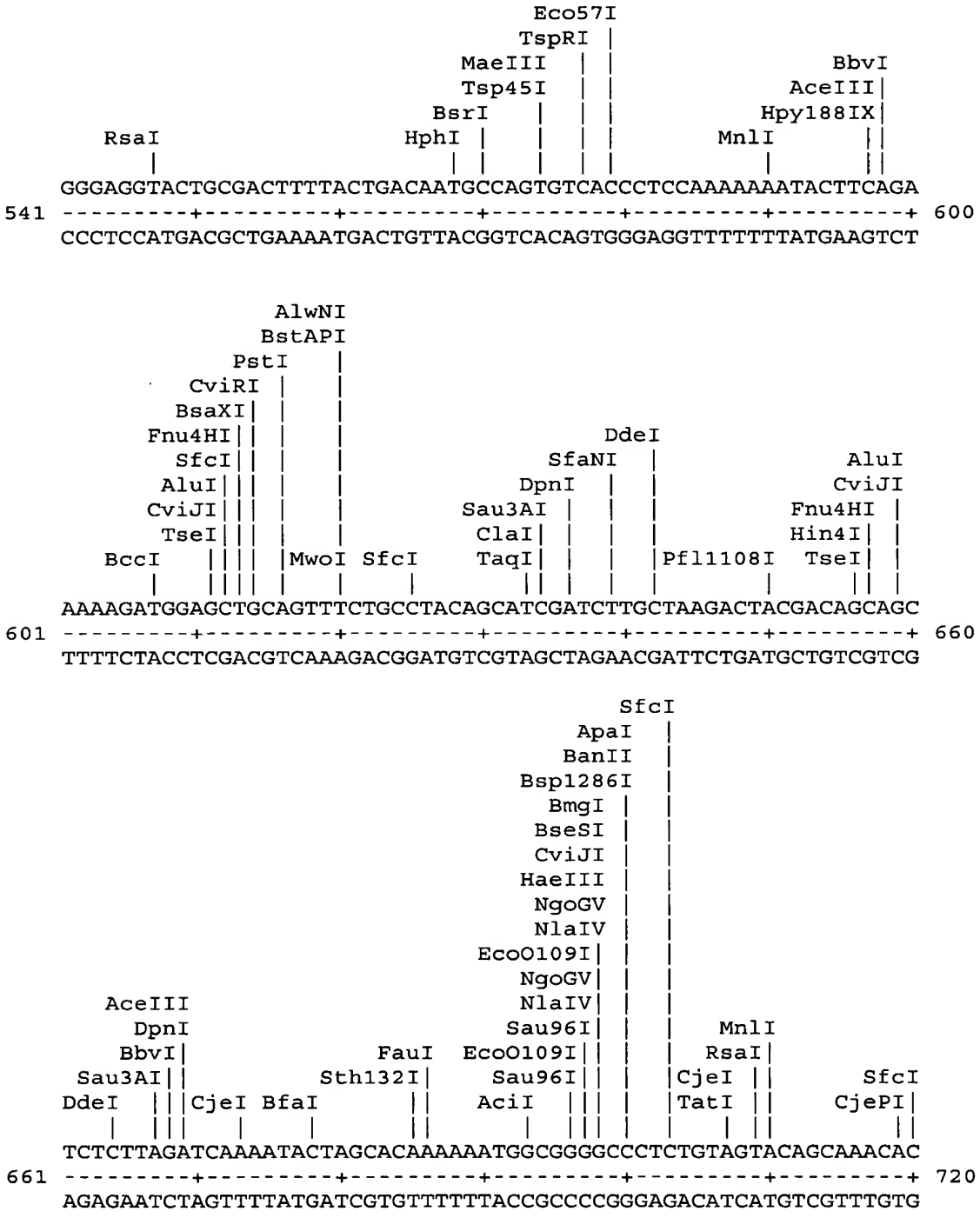

Figure 8D

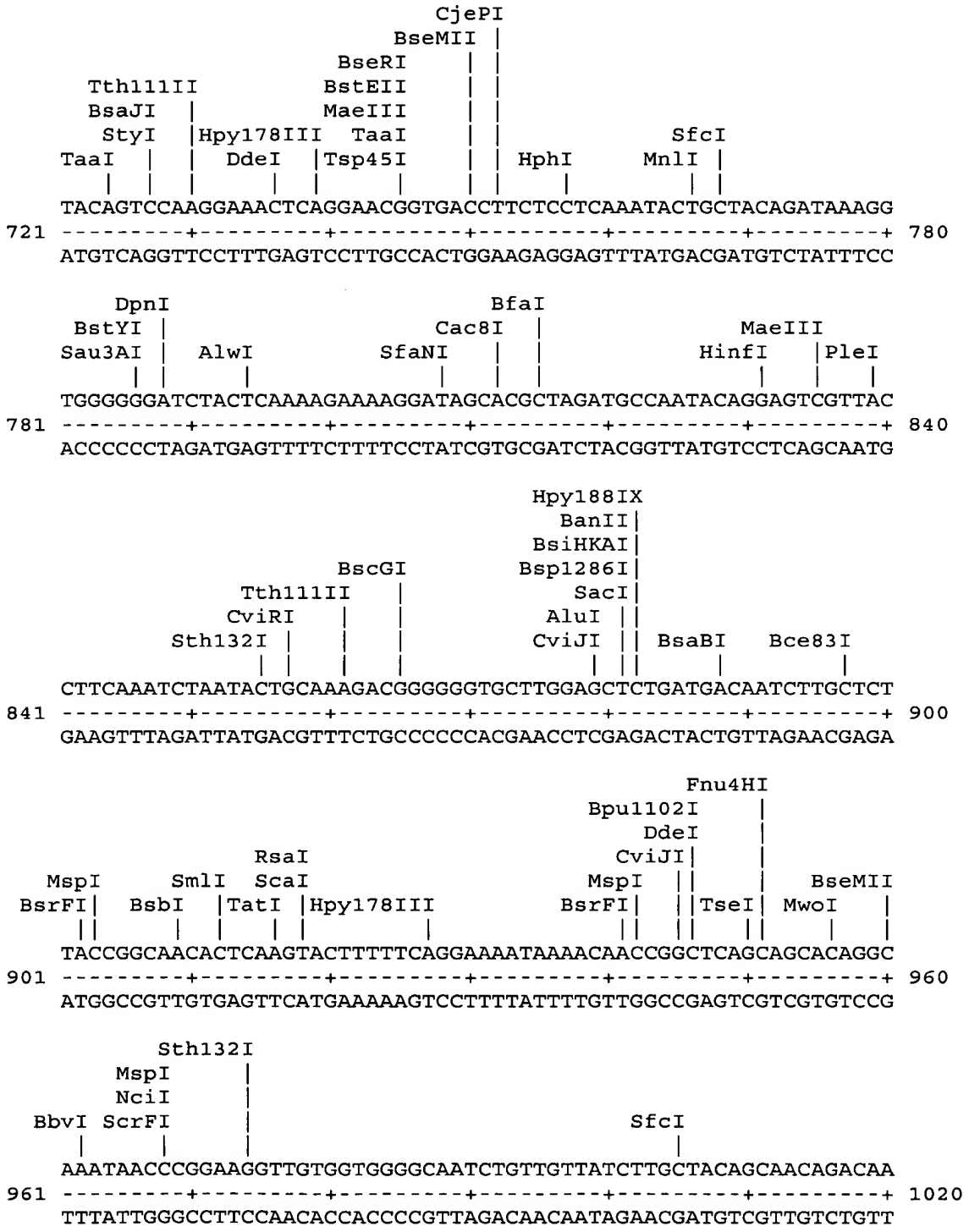

Figure 8E

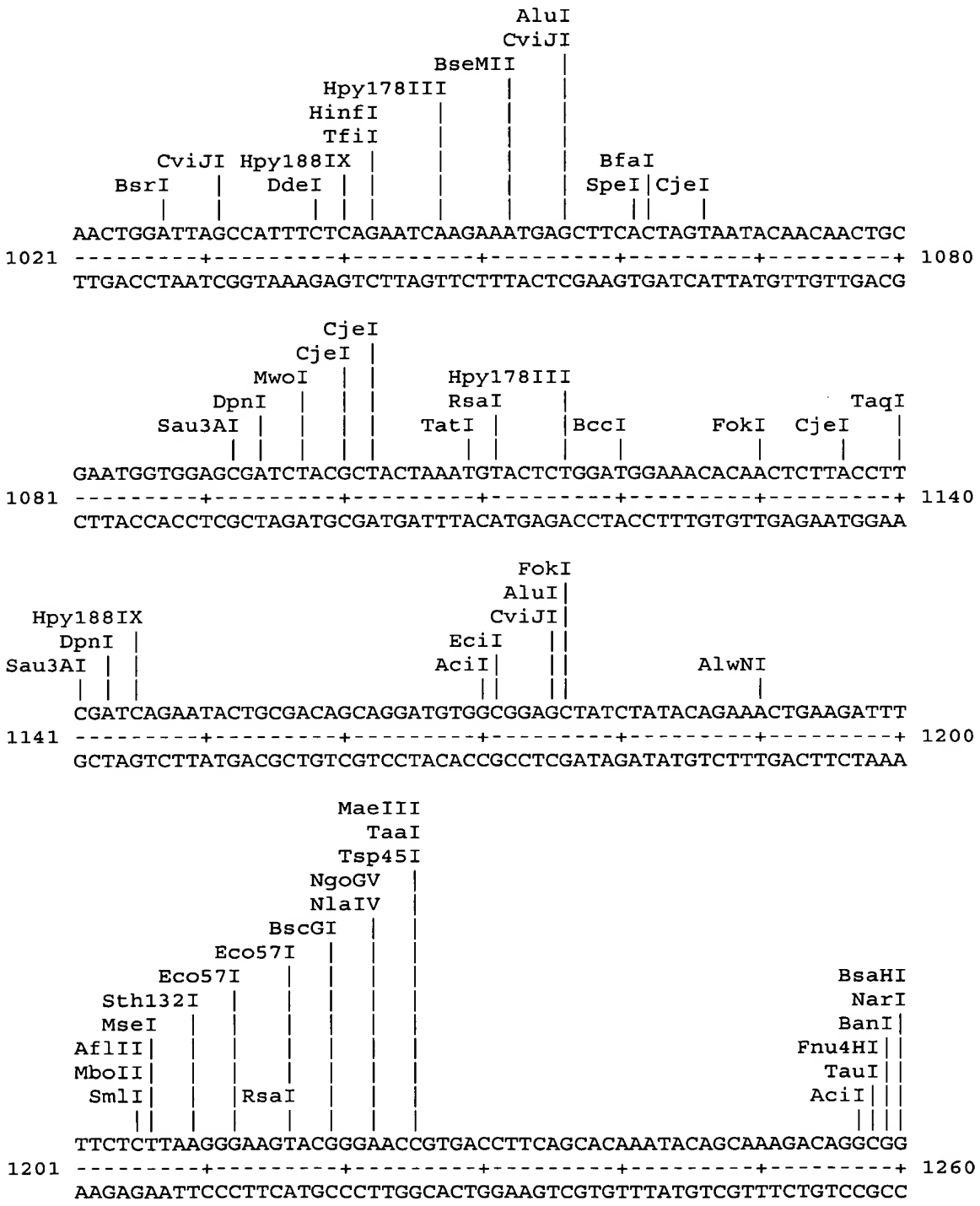

Figure 8F

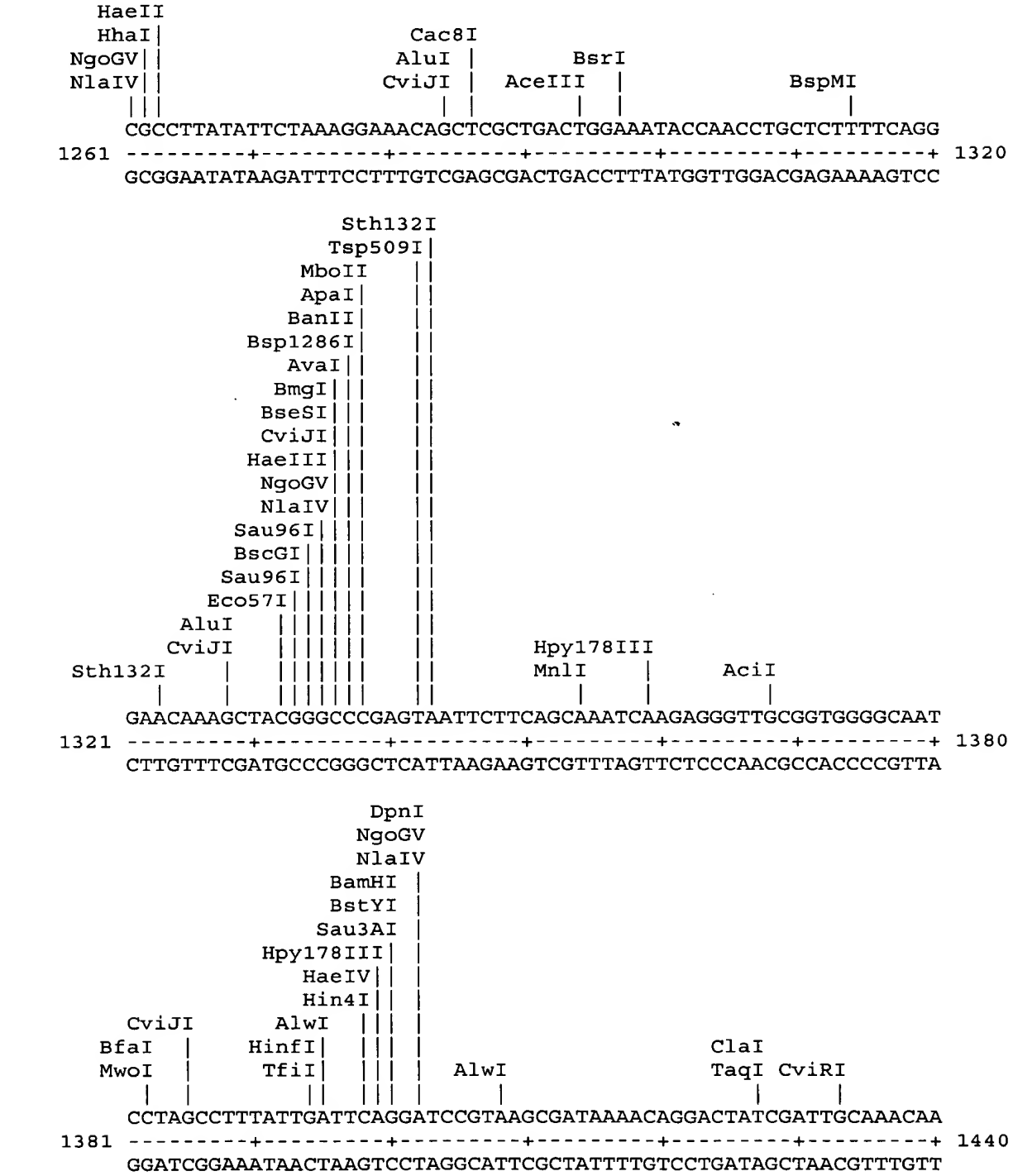

Figure 8G

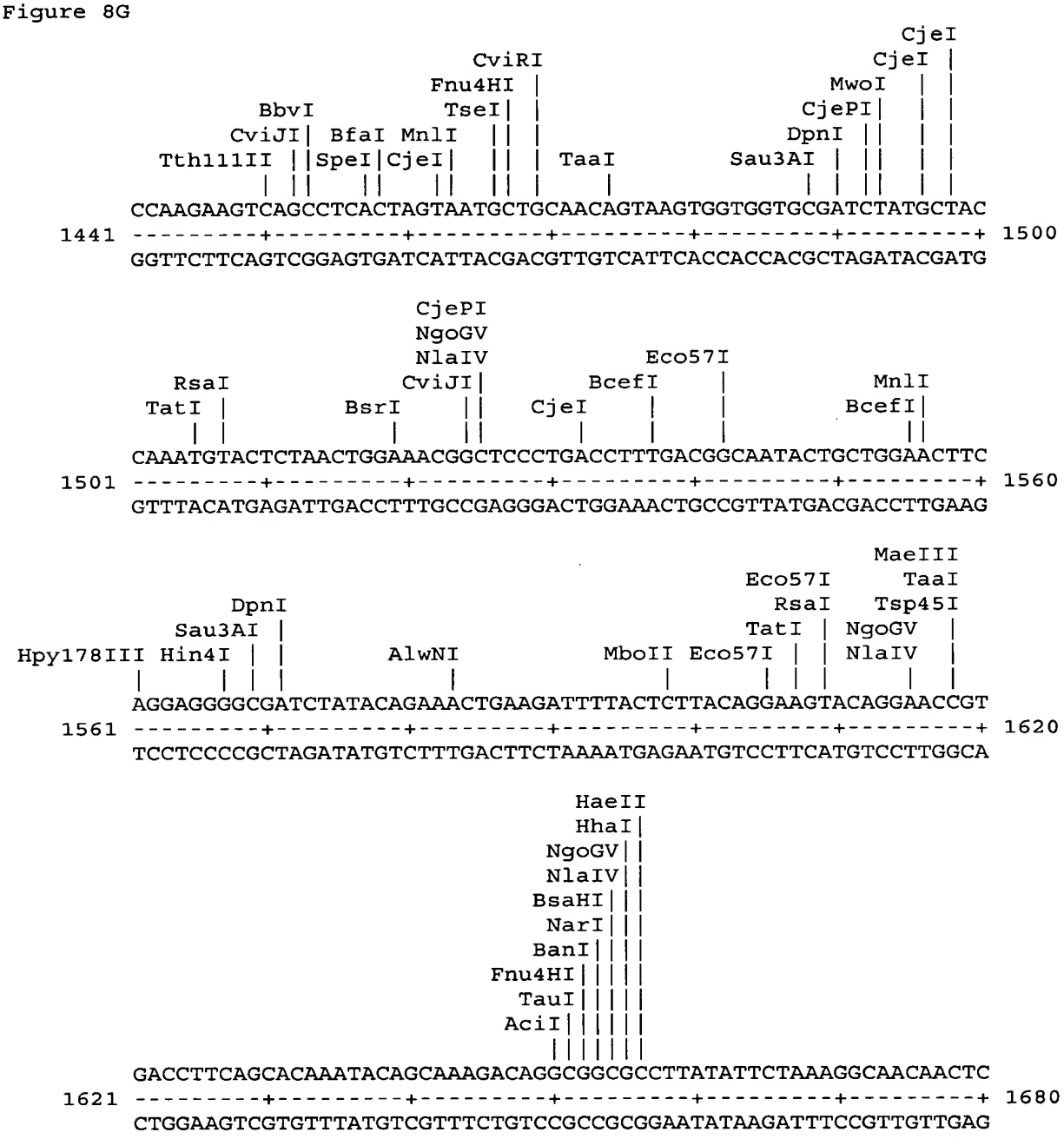

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Figure 8H

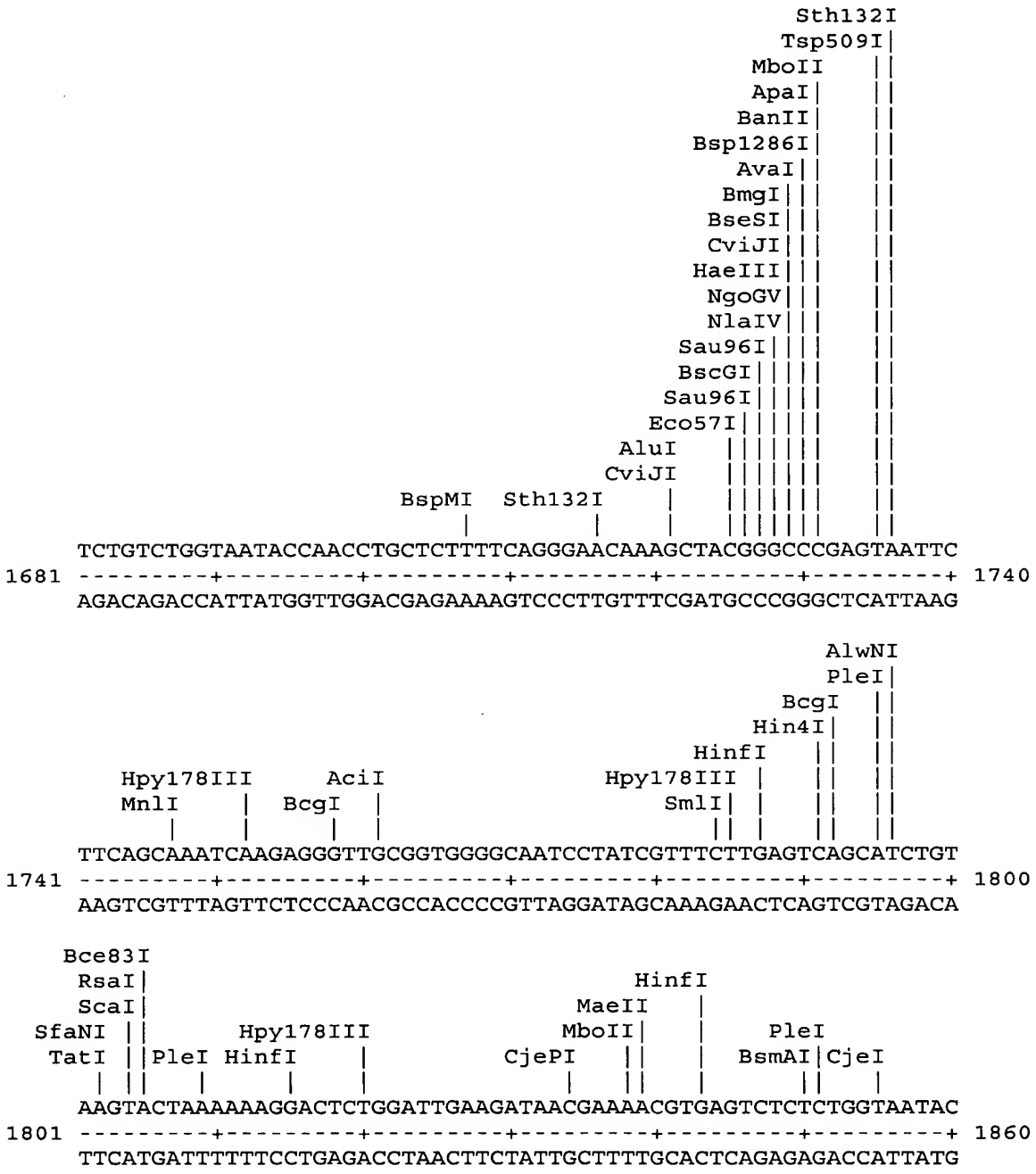

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Figure 8I

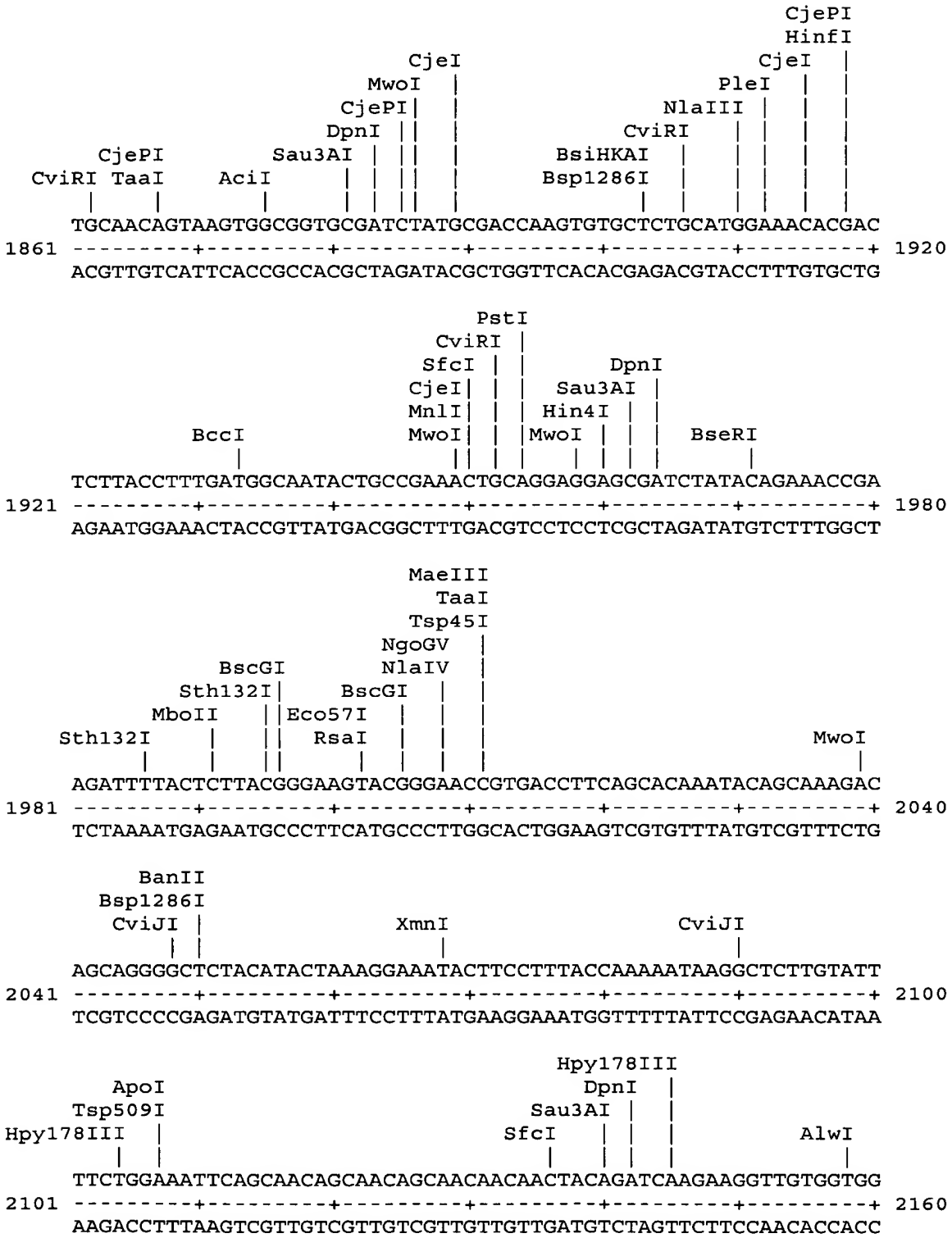

Figure 8J

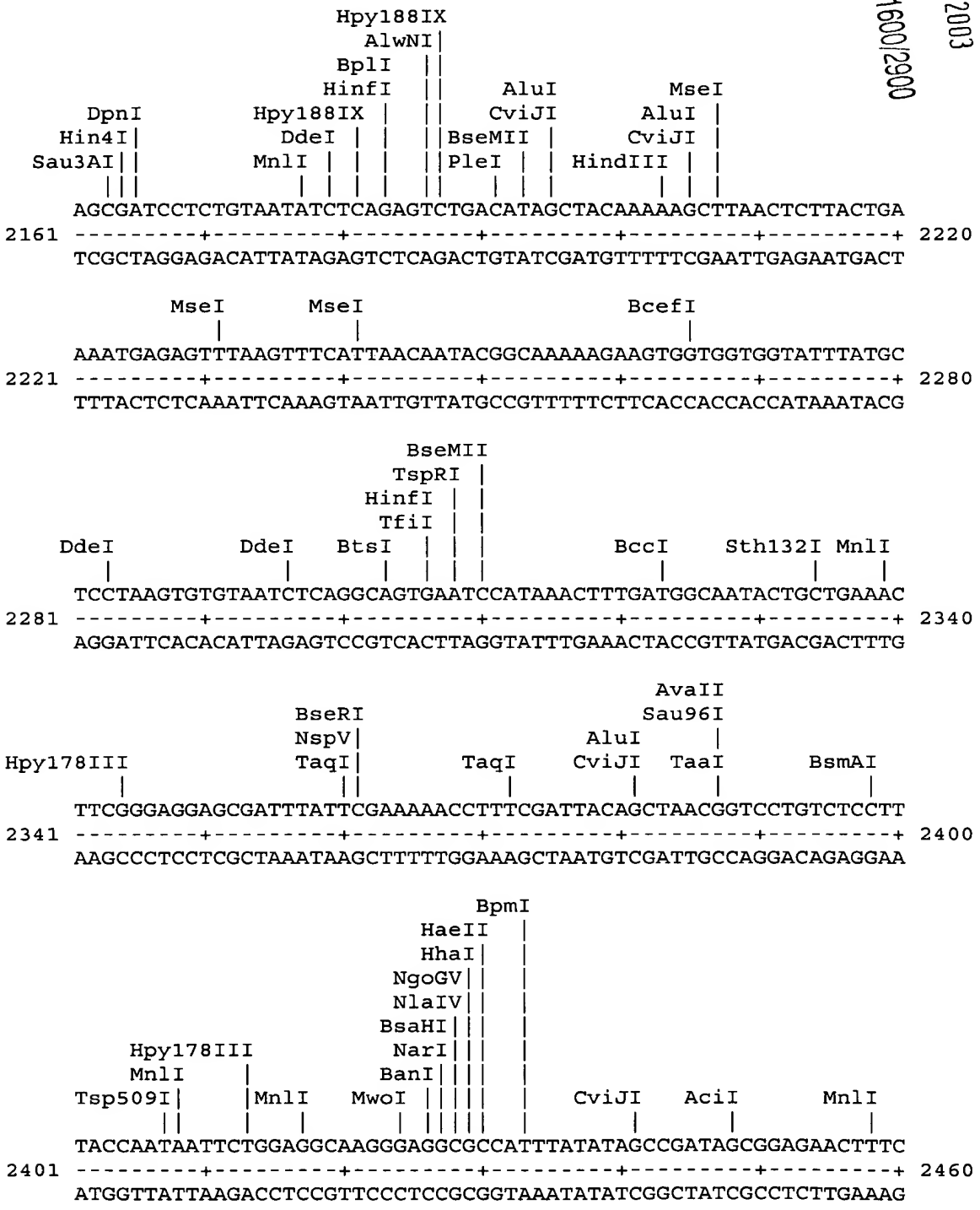

Figure 8K

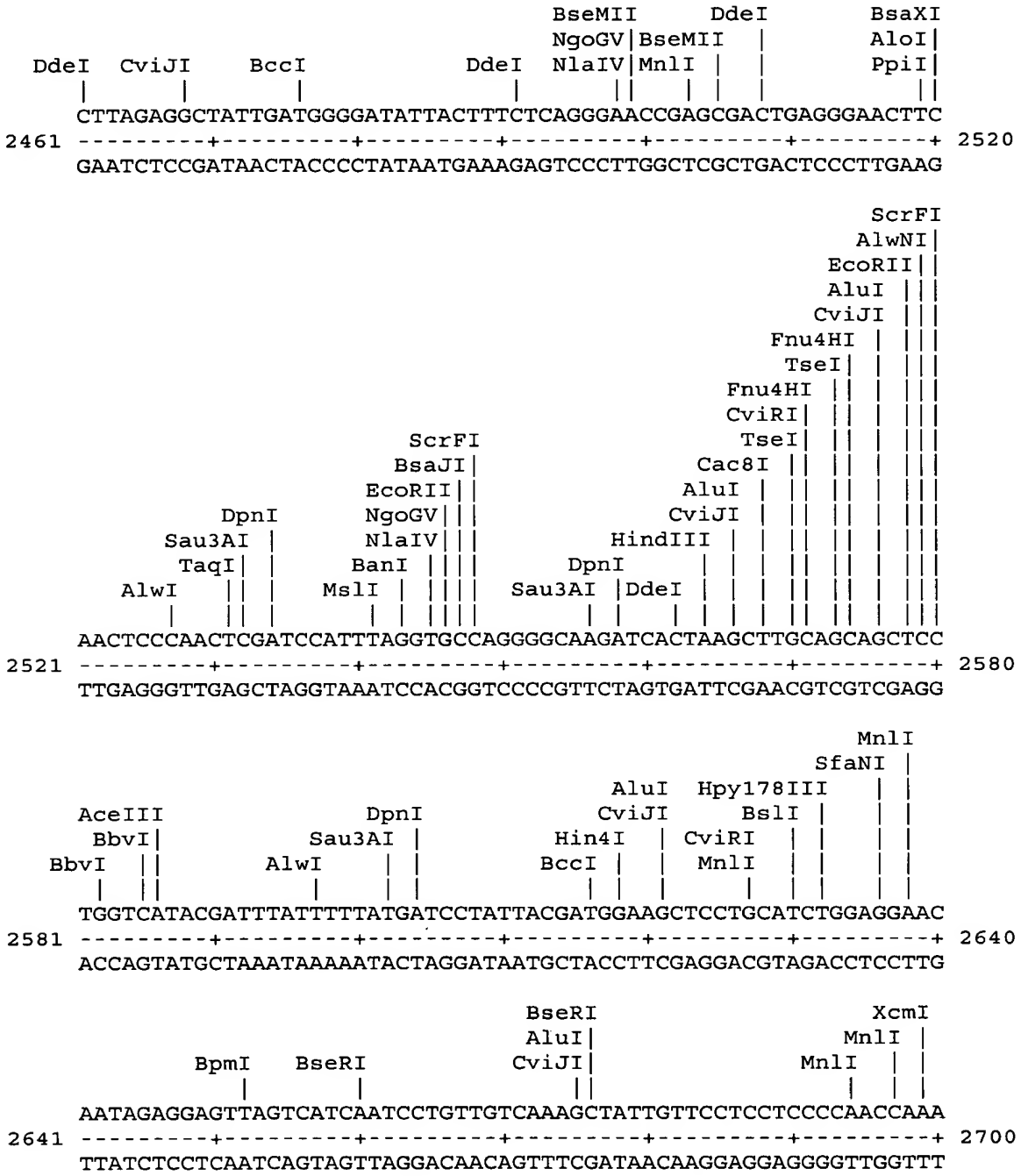

Figure 8L

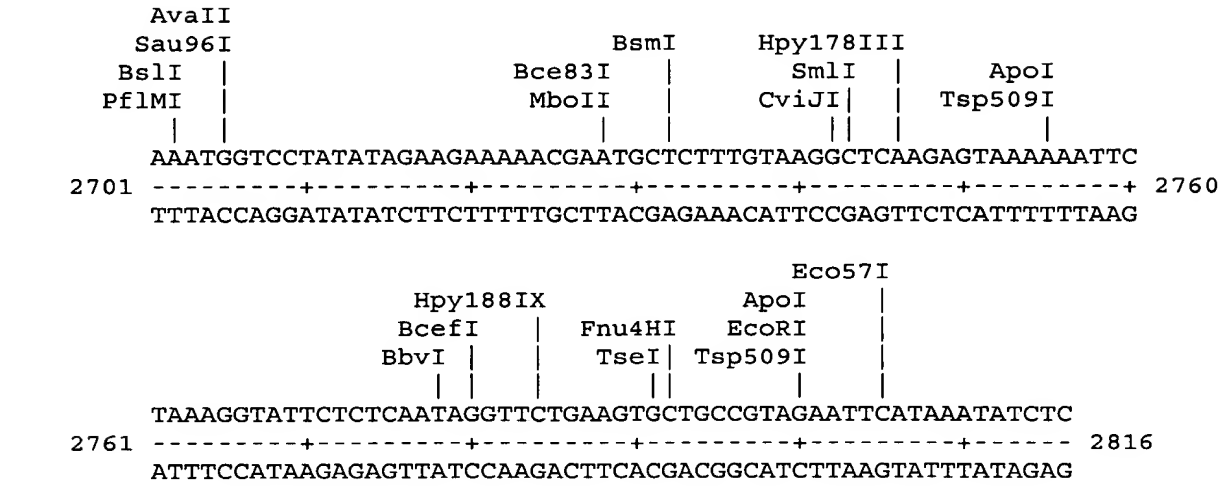

Figure 9A
Restriction enzyme analysis of CPN100624 (RY 64 - SEQ ID NO. 9)

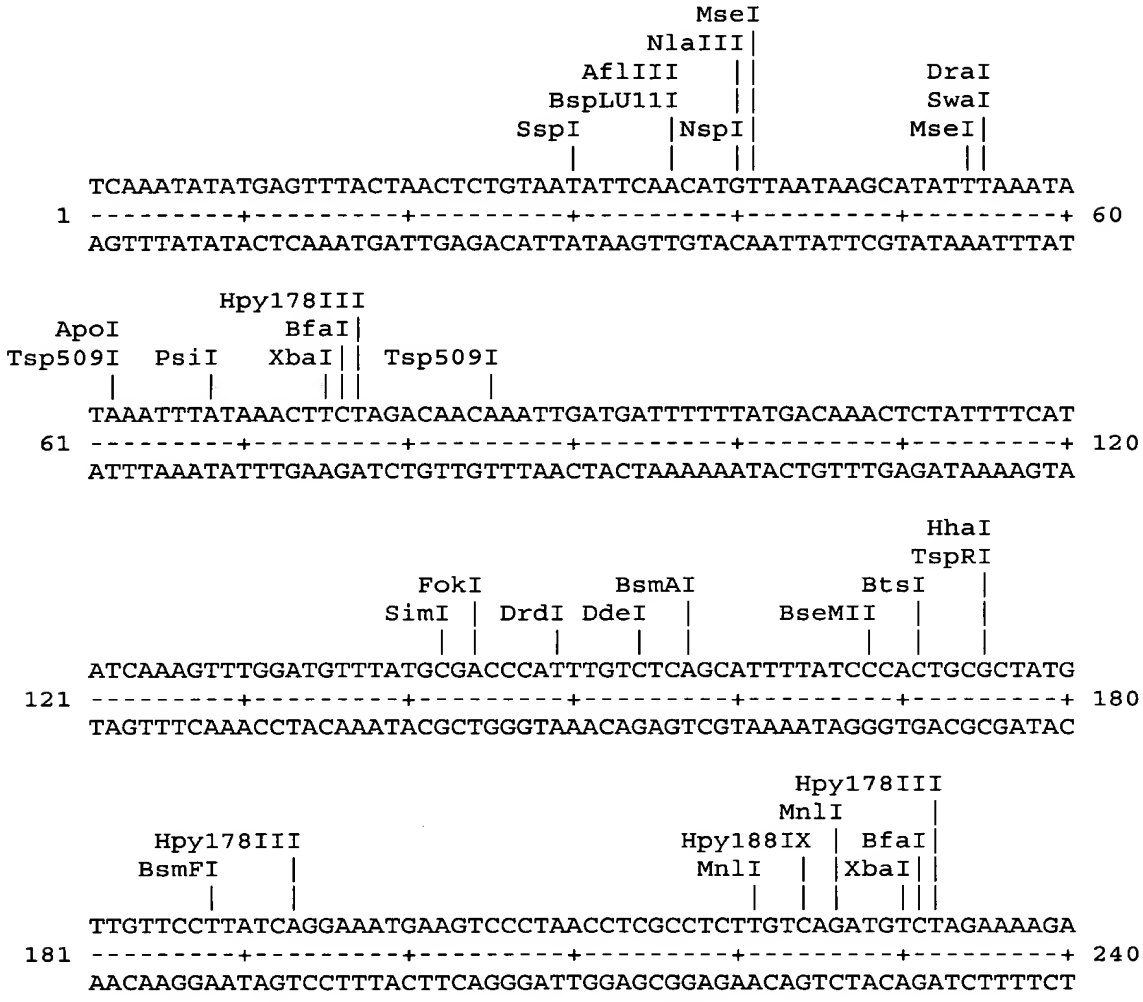

Figure 9B

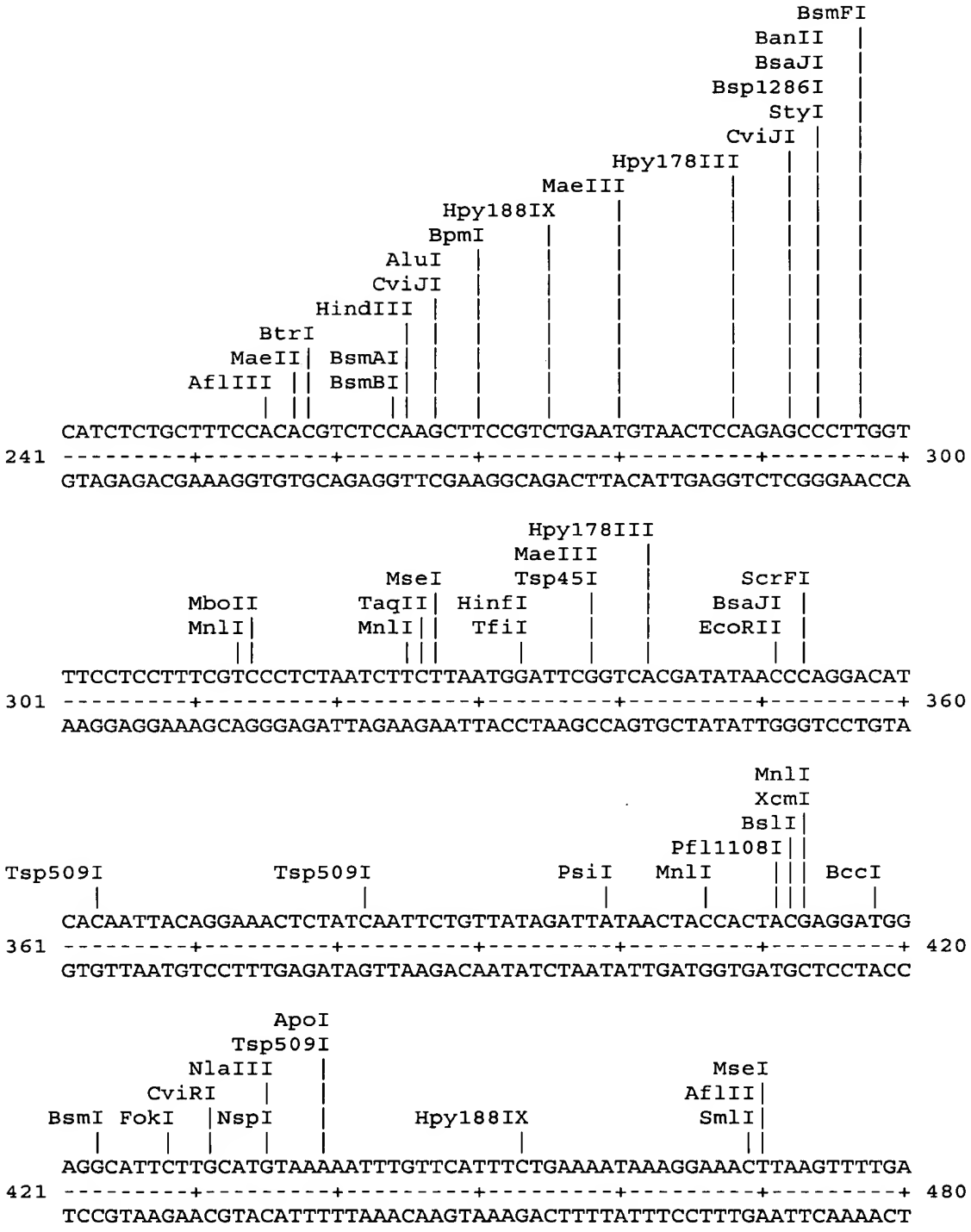

Figure 9C

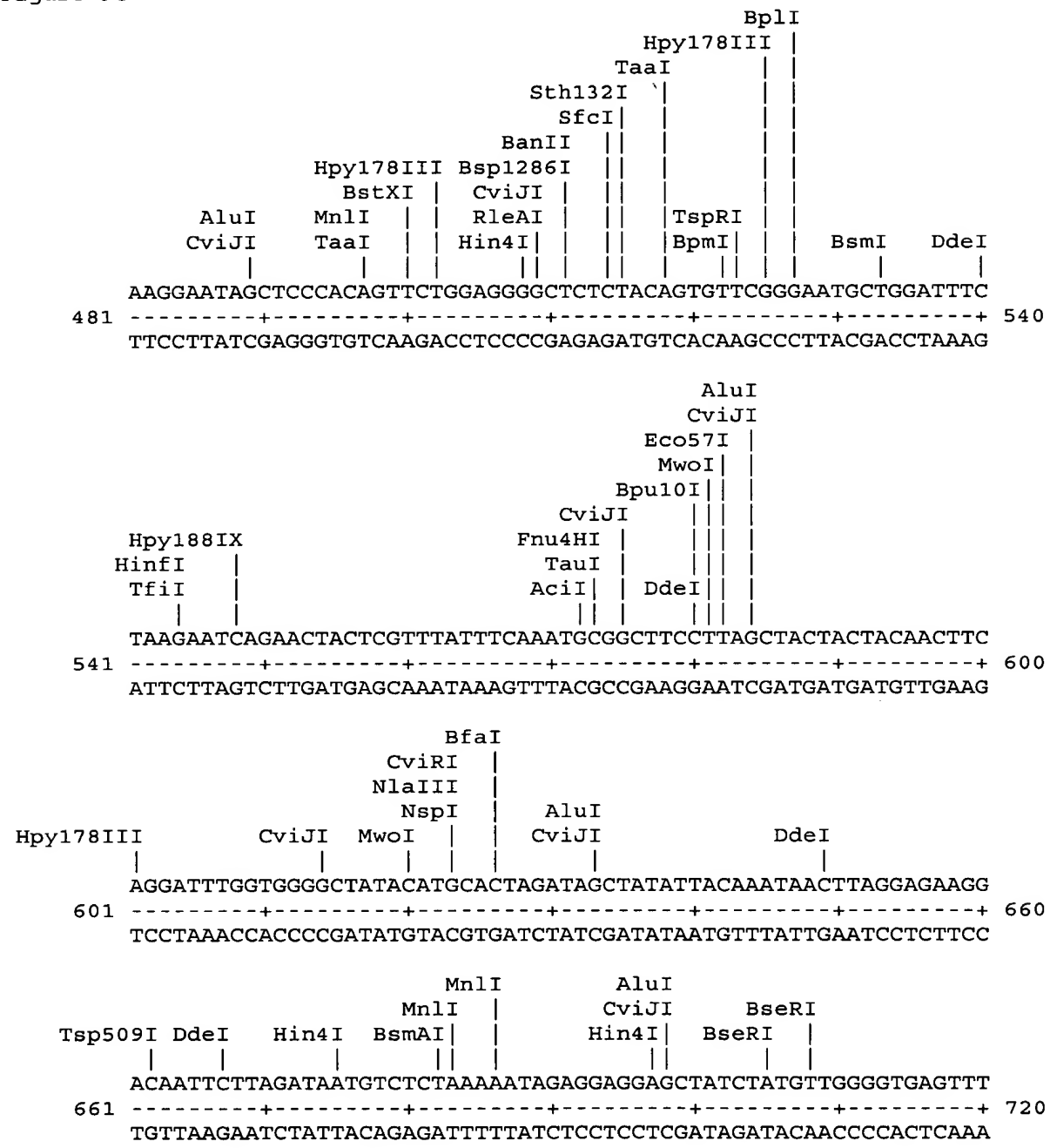

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Figure 9D

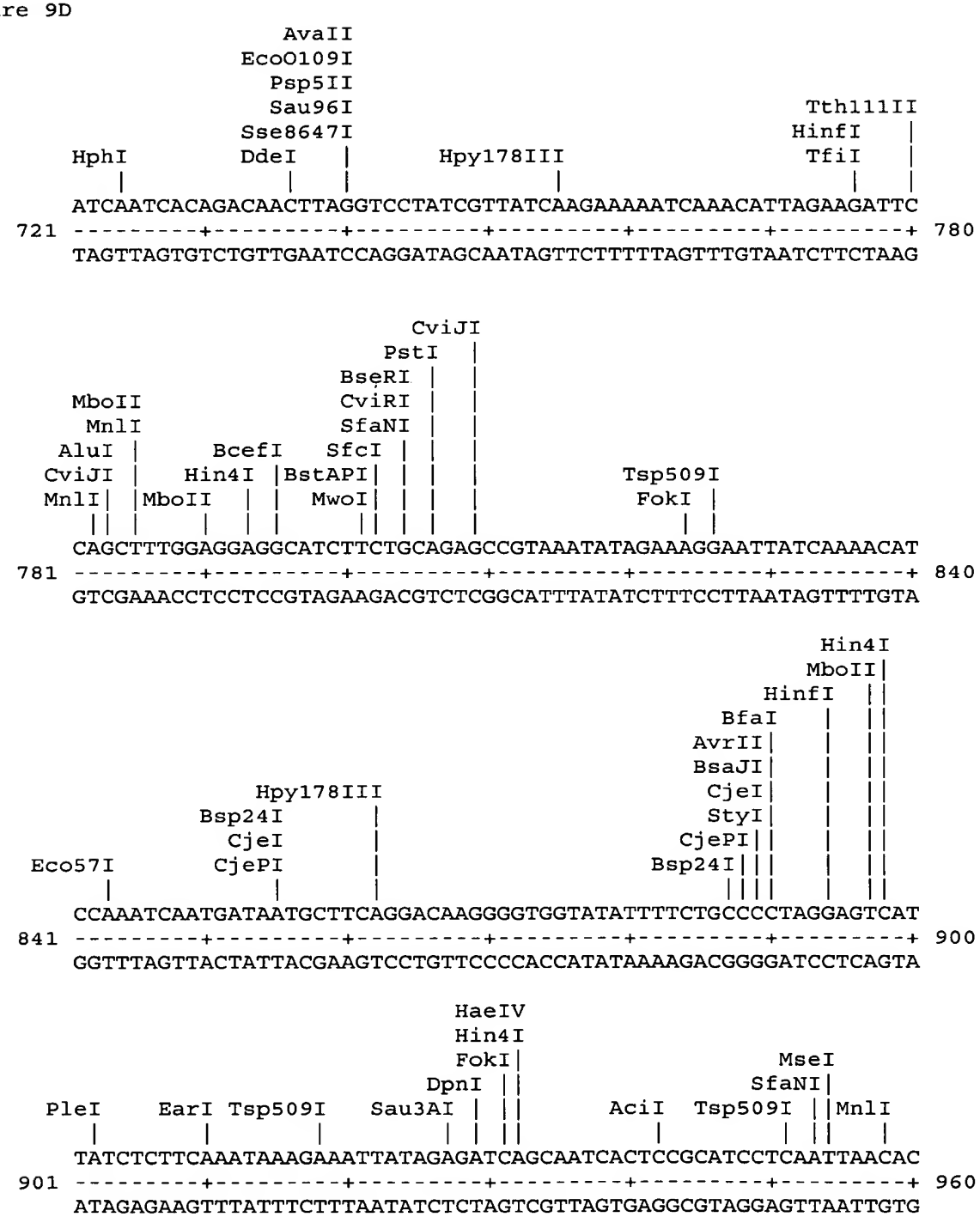

Figure 9E

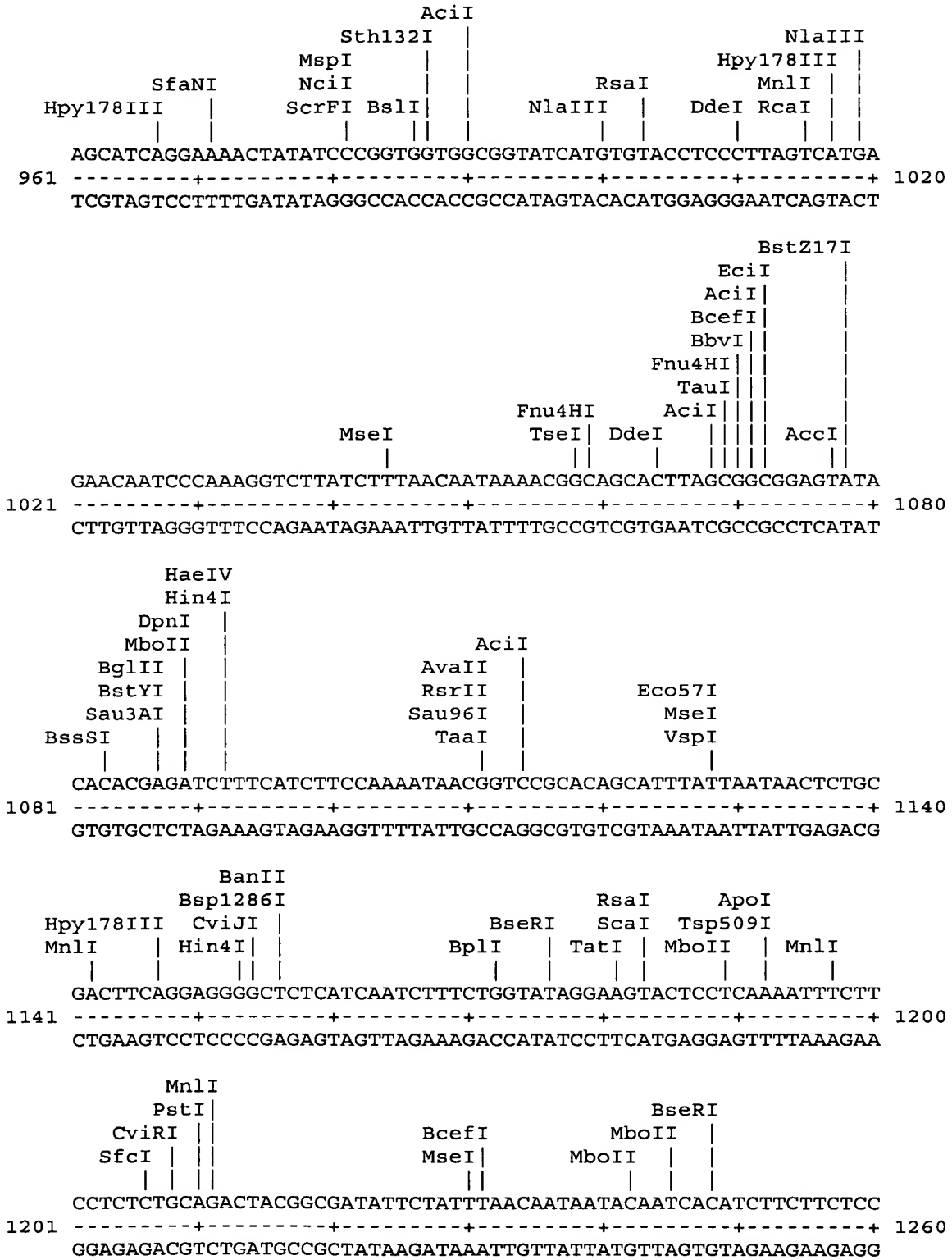

Figure 9F

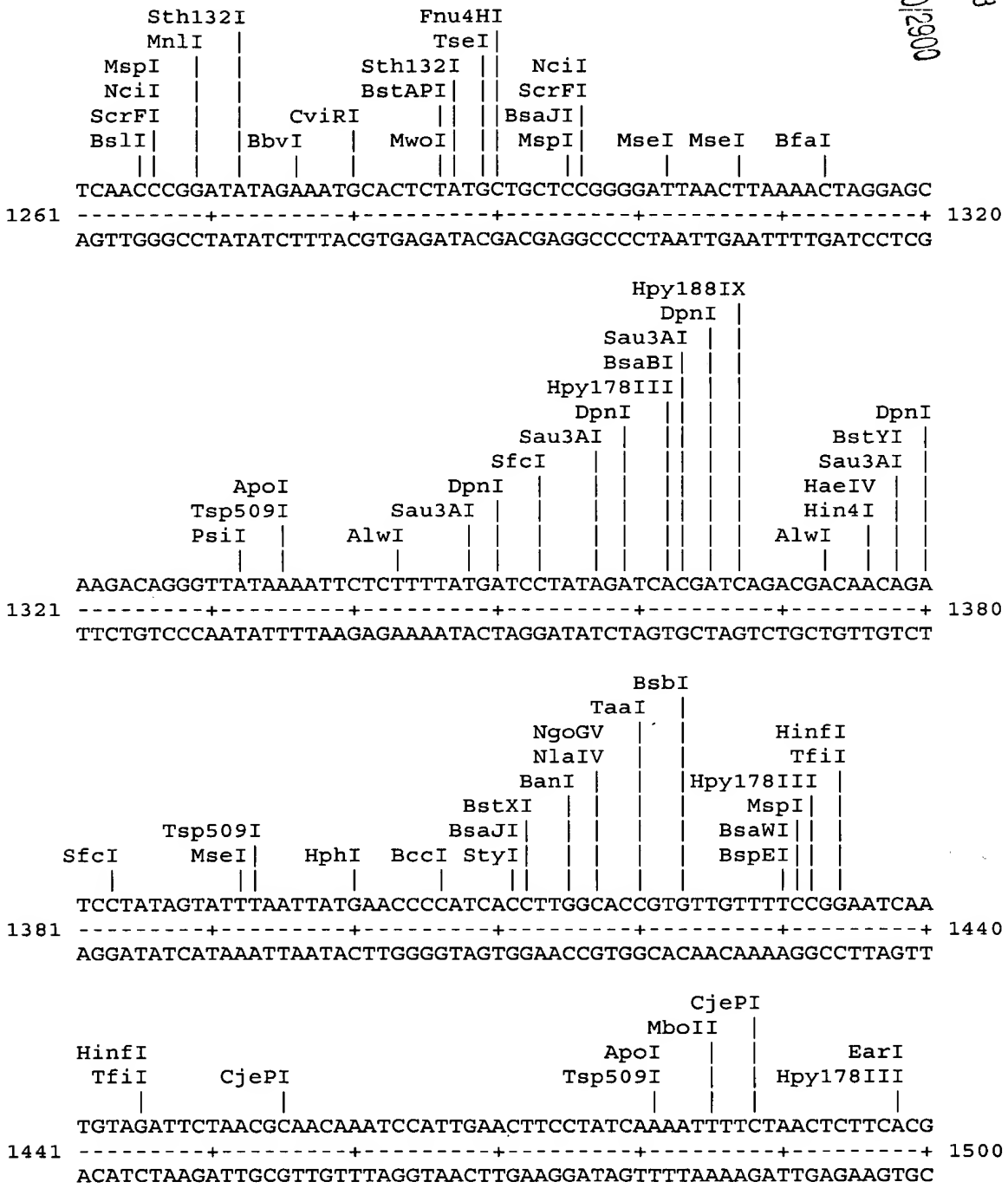

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Figure 9G

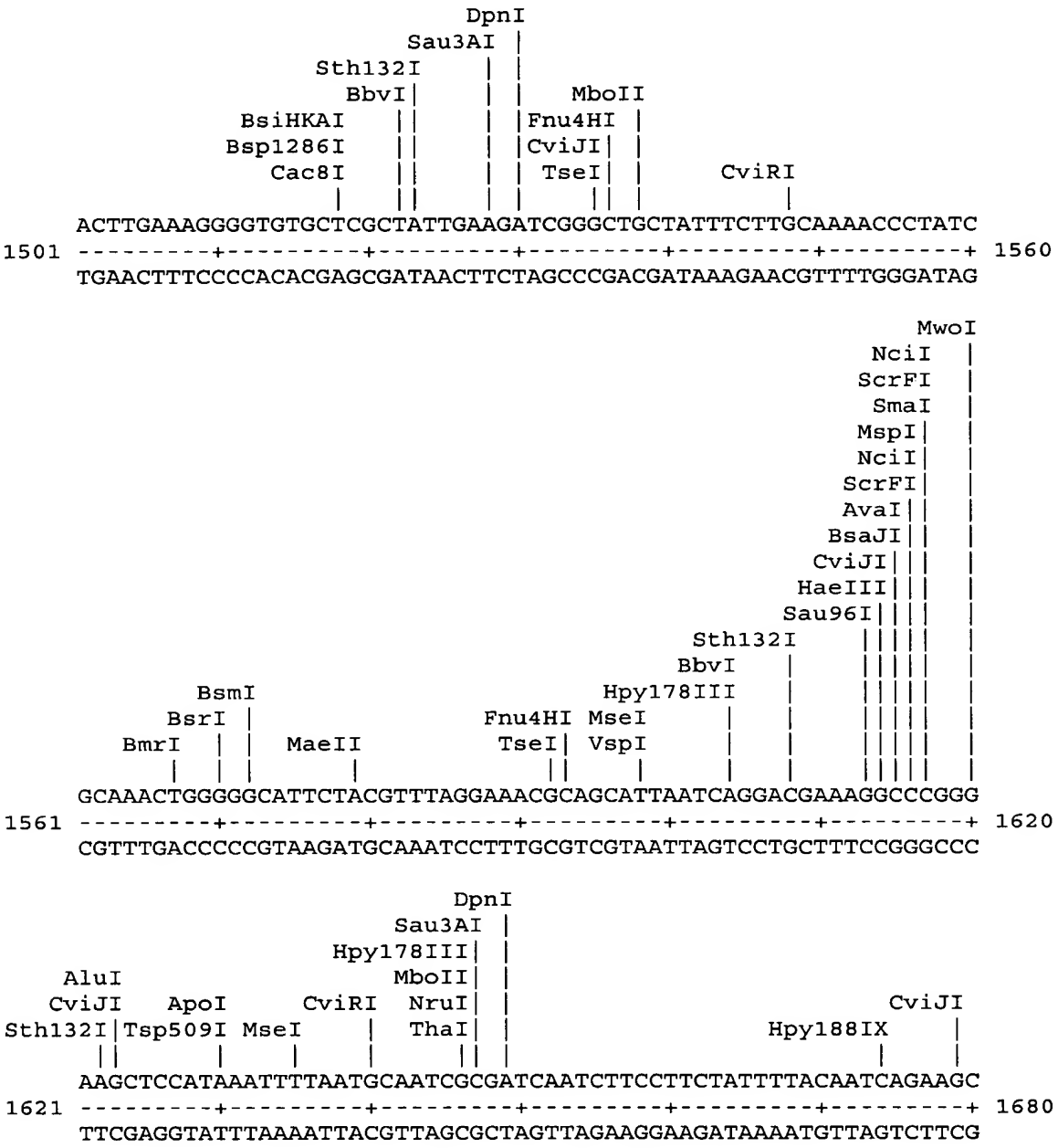

Figure 9H

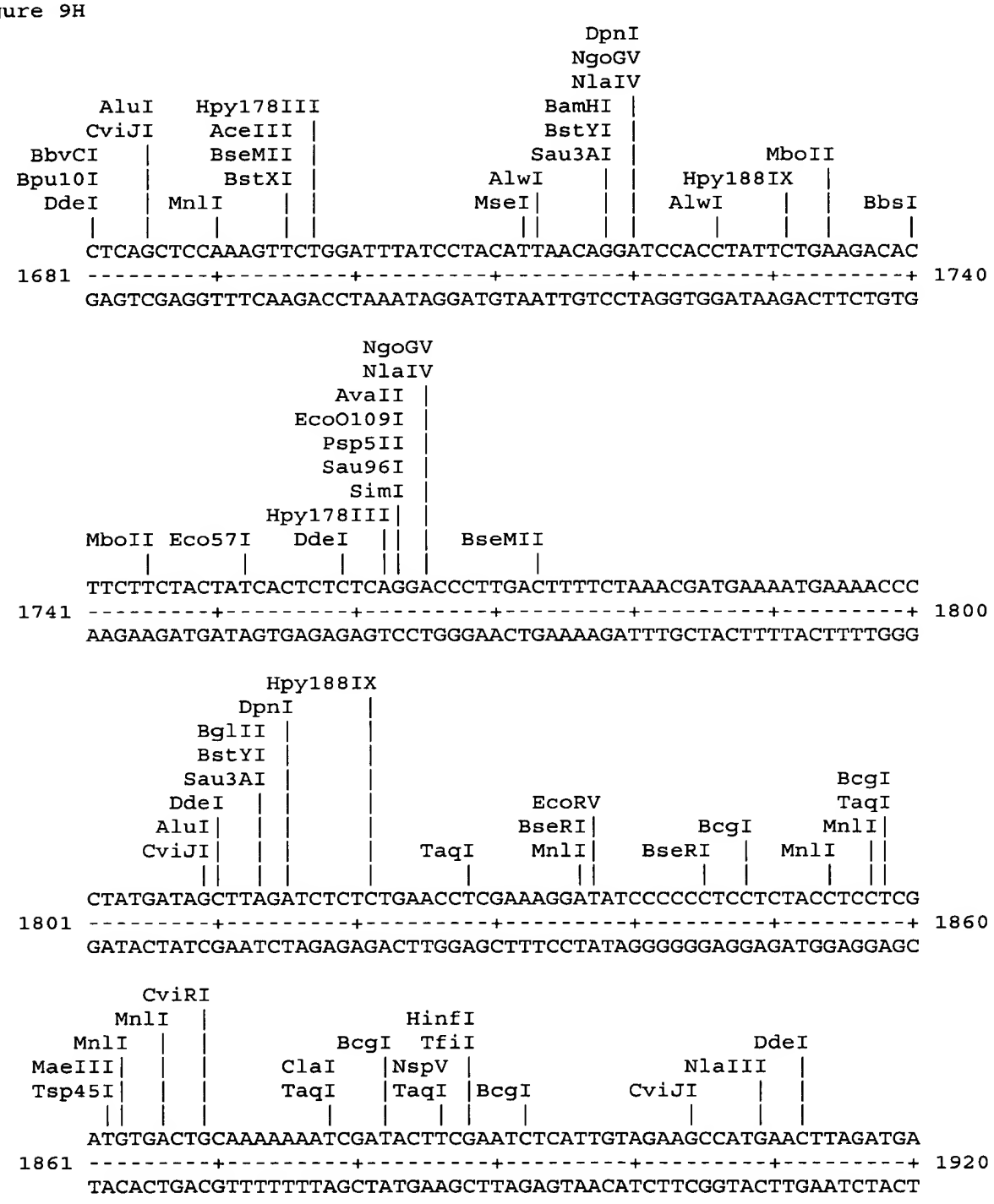

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Figure 9I

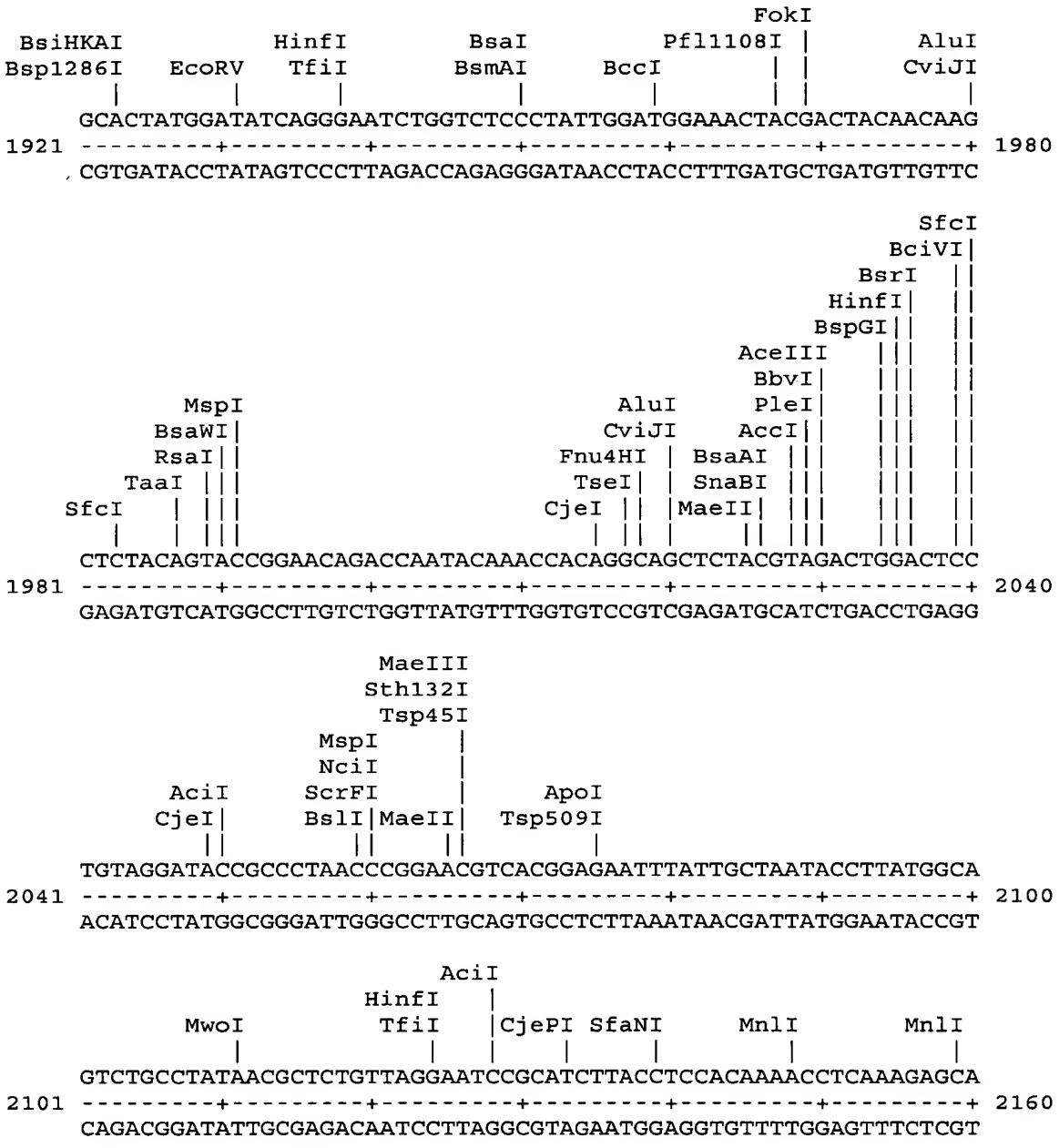

Figure 9J

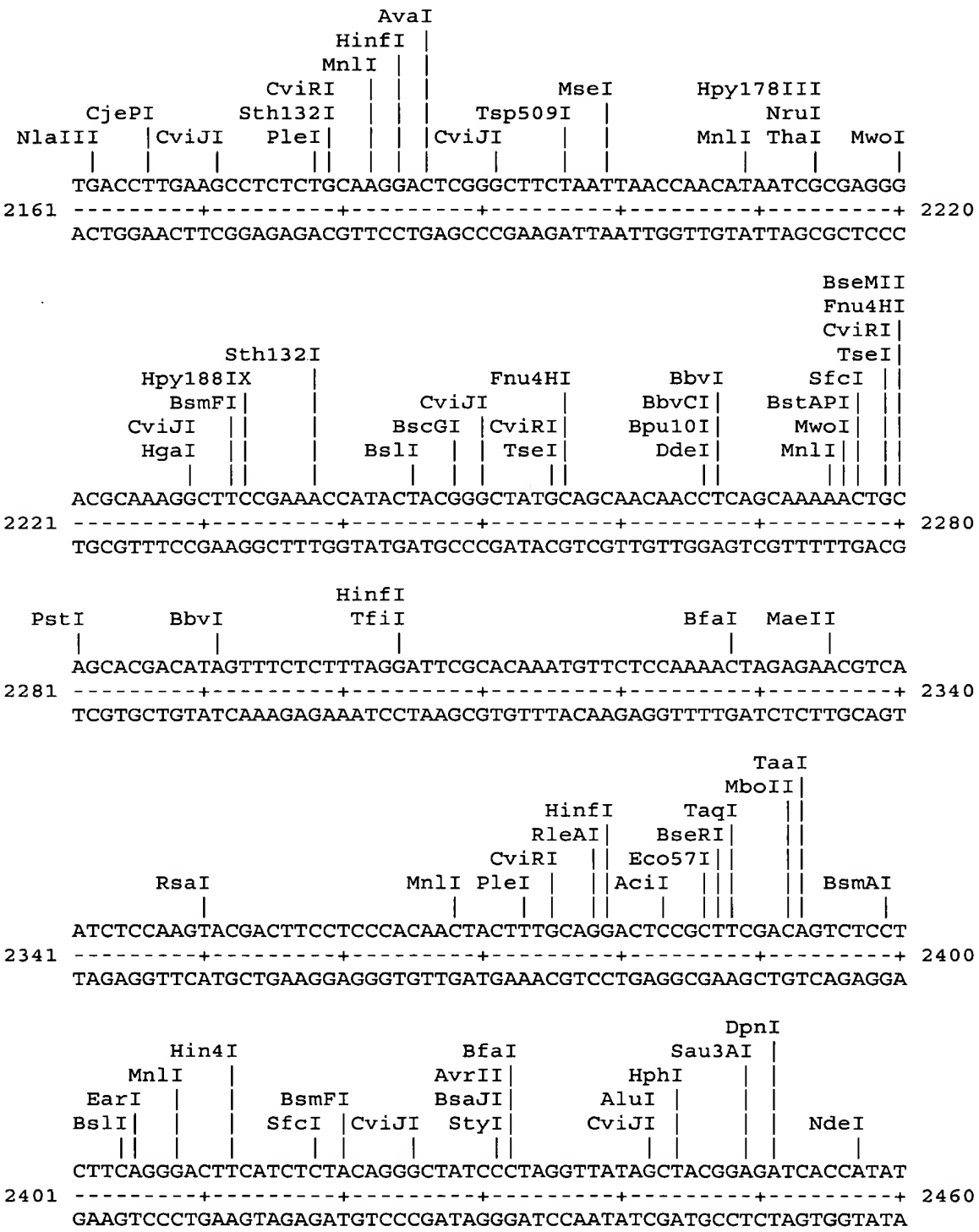

Figure 9K

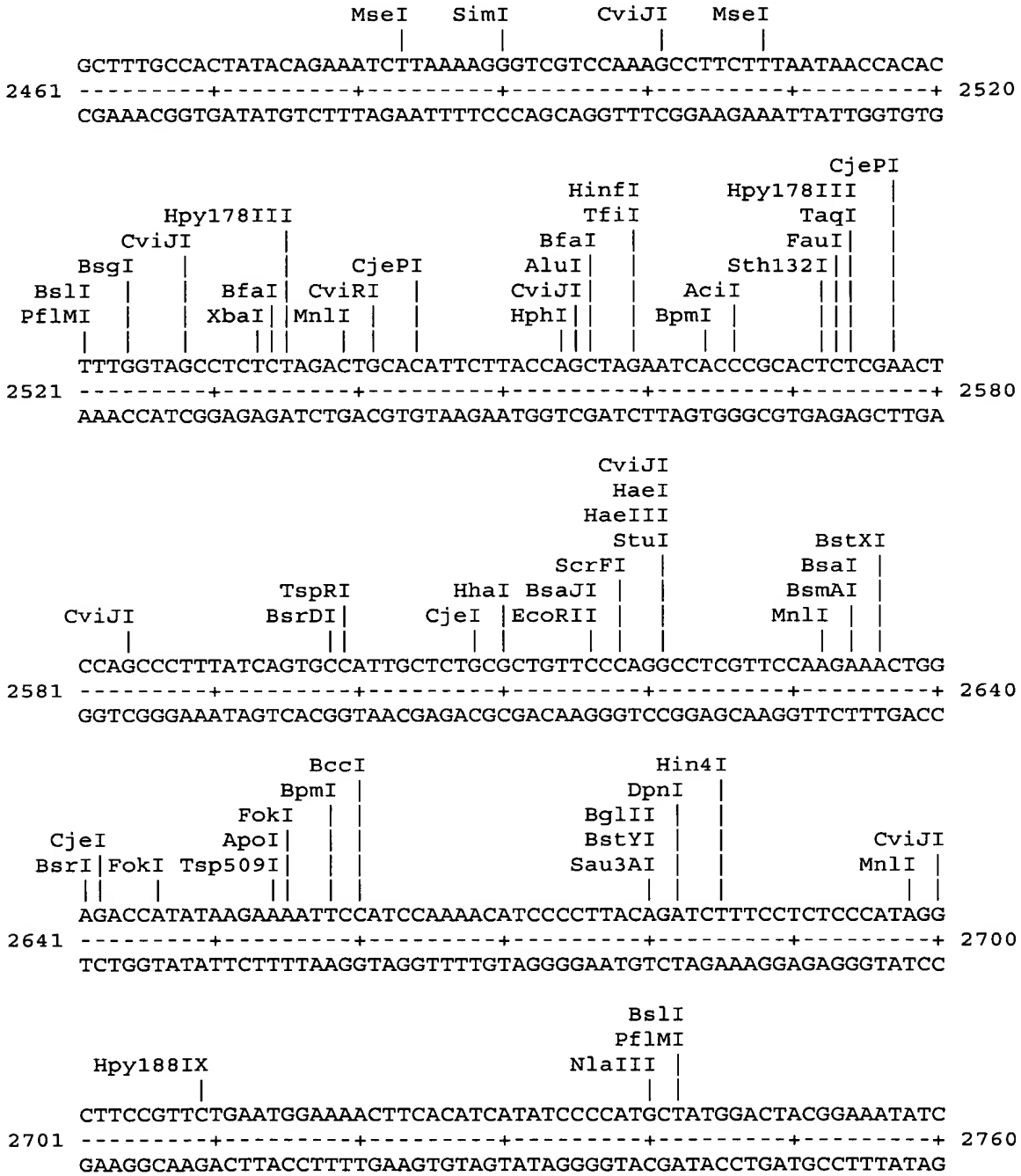

Figure 9L

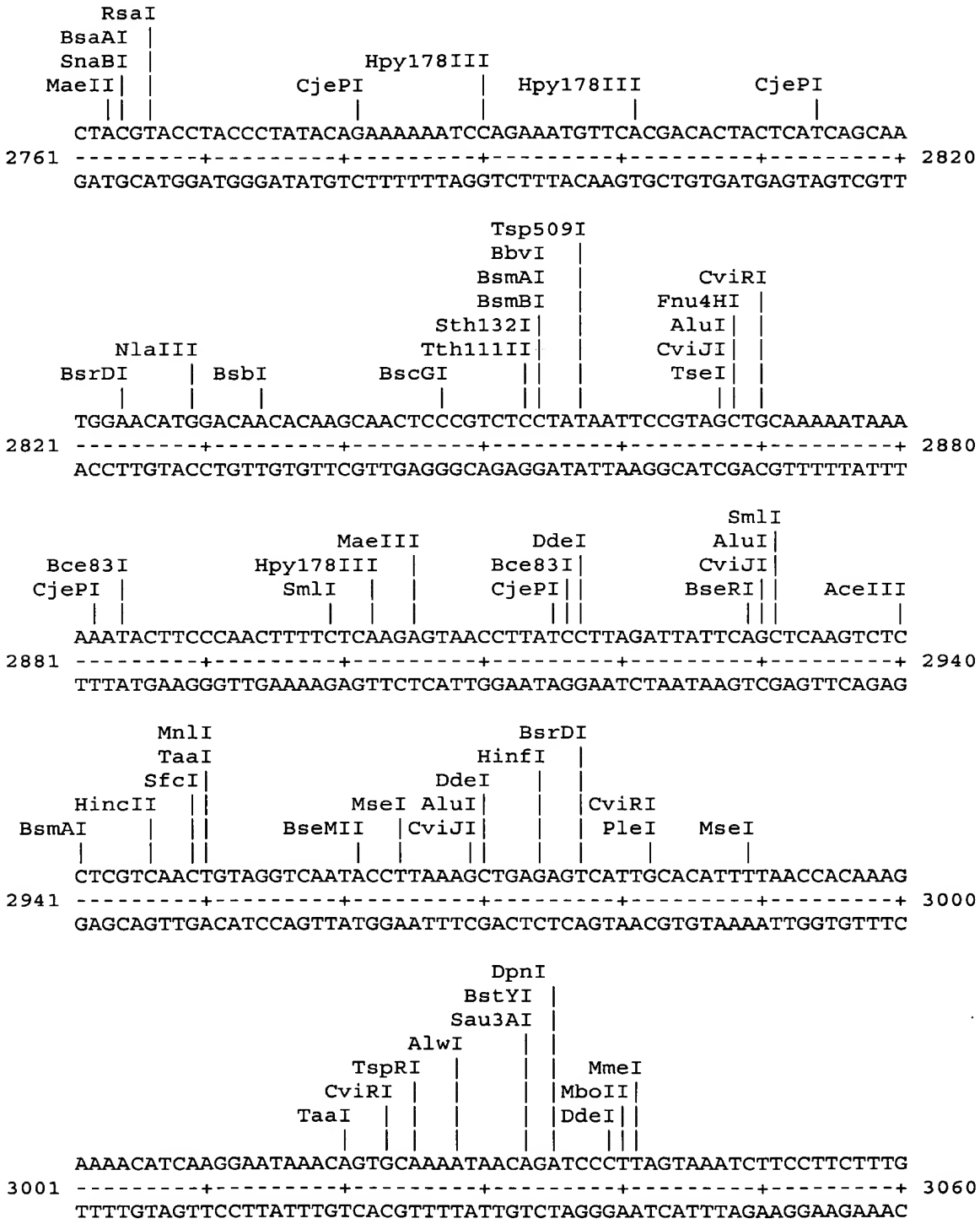

Figure 9M

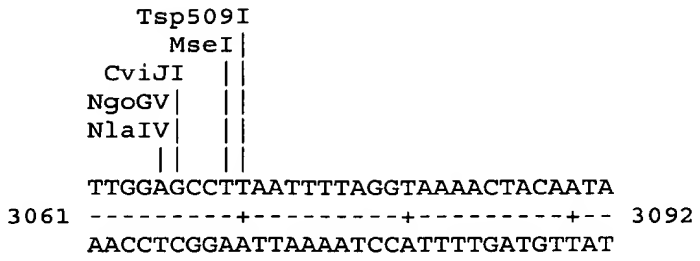

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Figure 10A

Restriction enzyme analysis of CPN100633 (RY 65 - SEQ ID NO. 10)

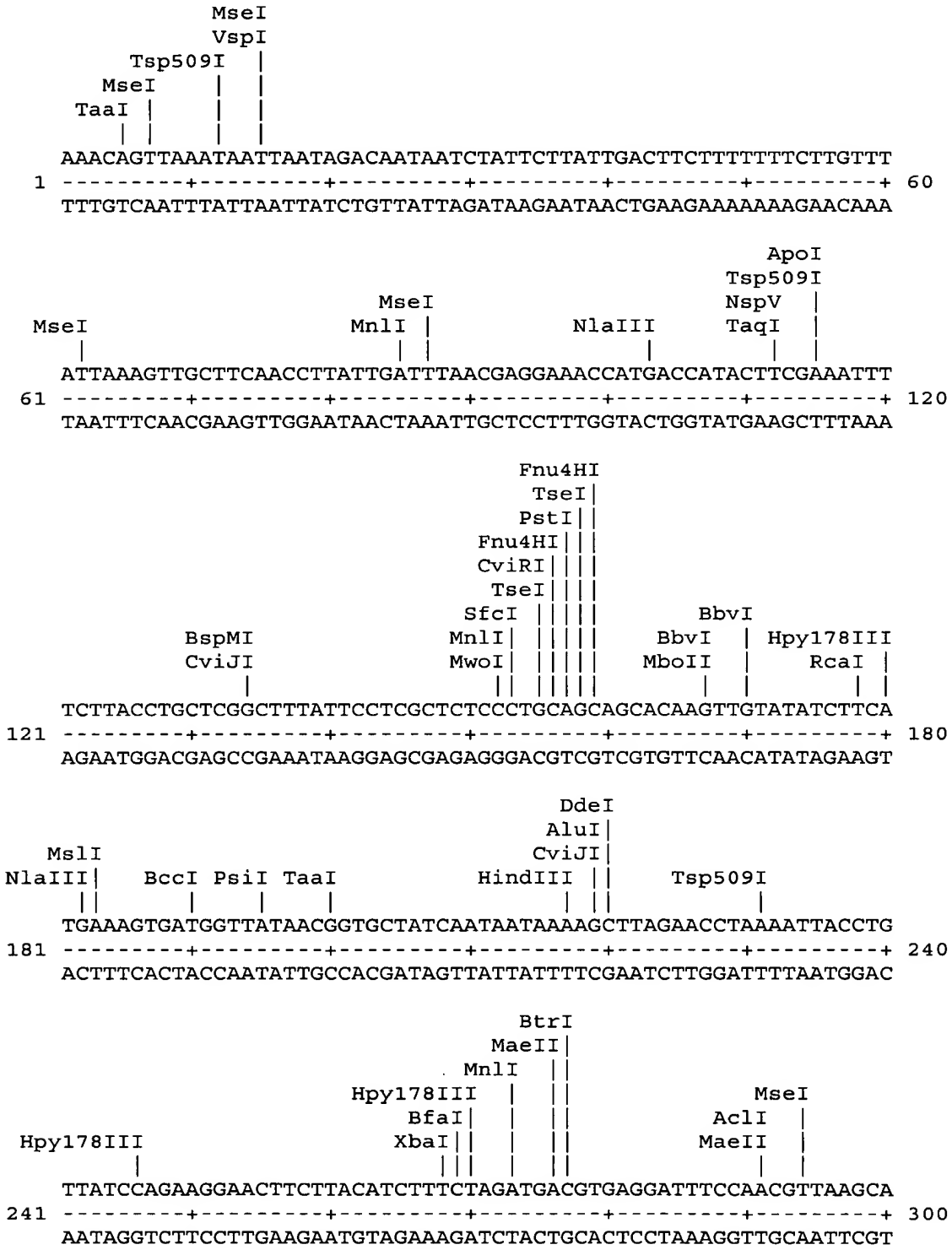

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Figure 10B

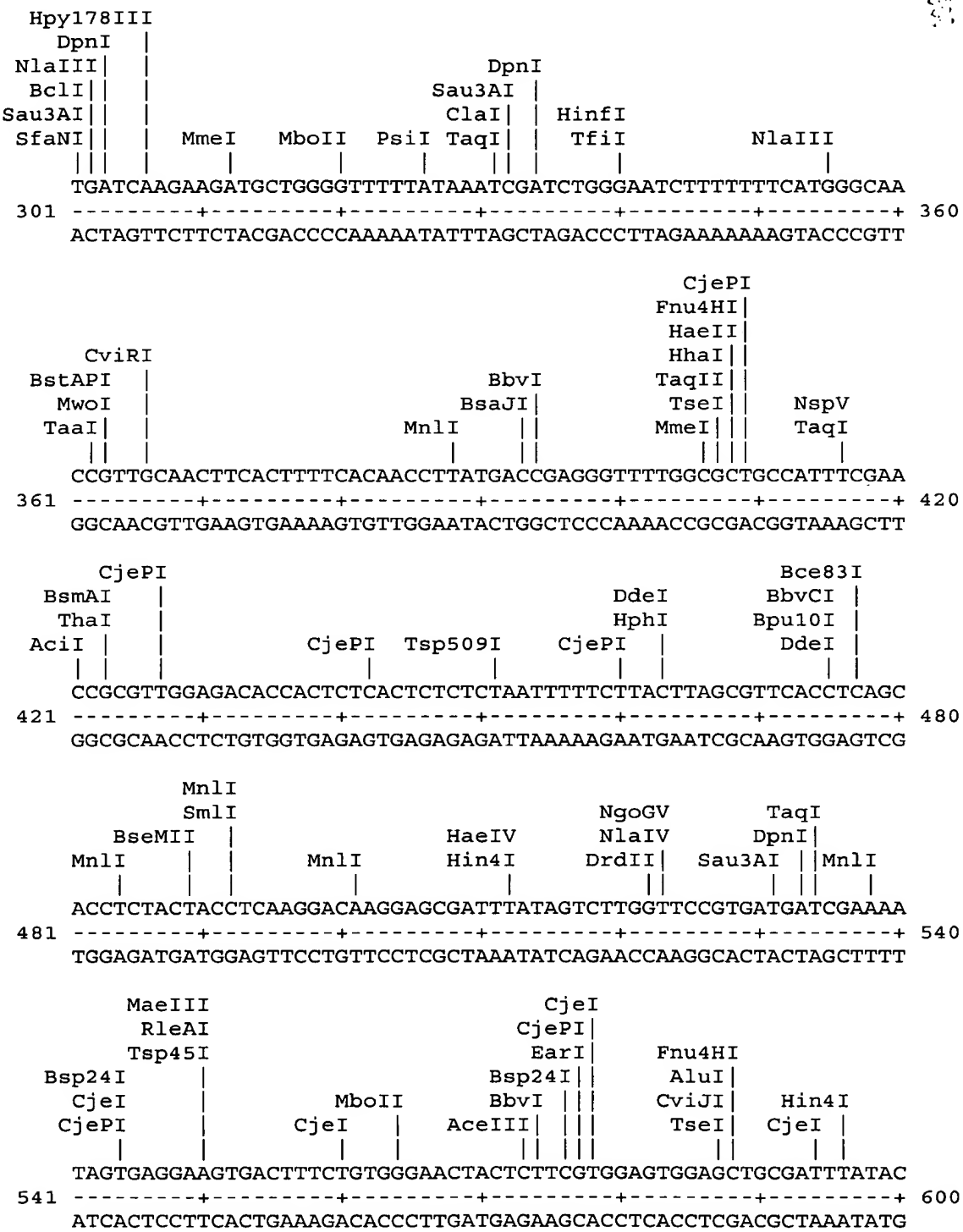

Figure 10C

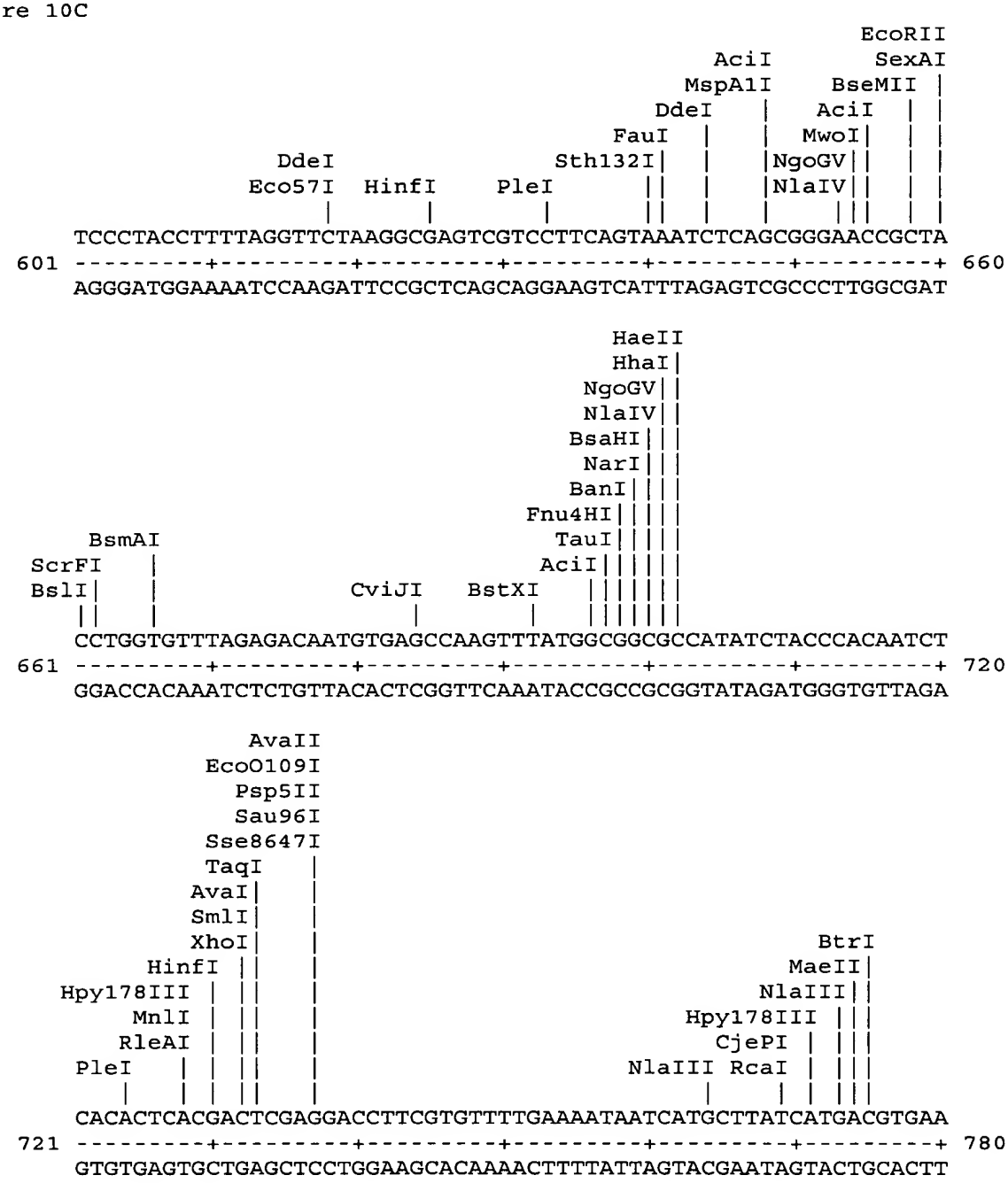

Figure 10D

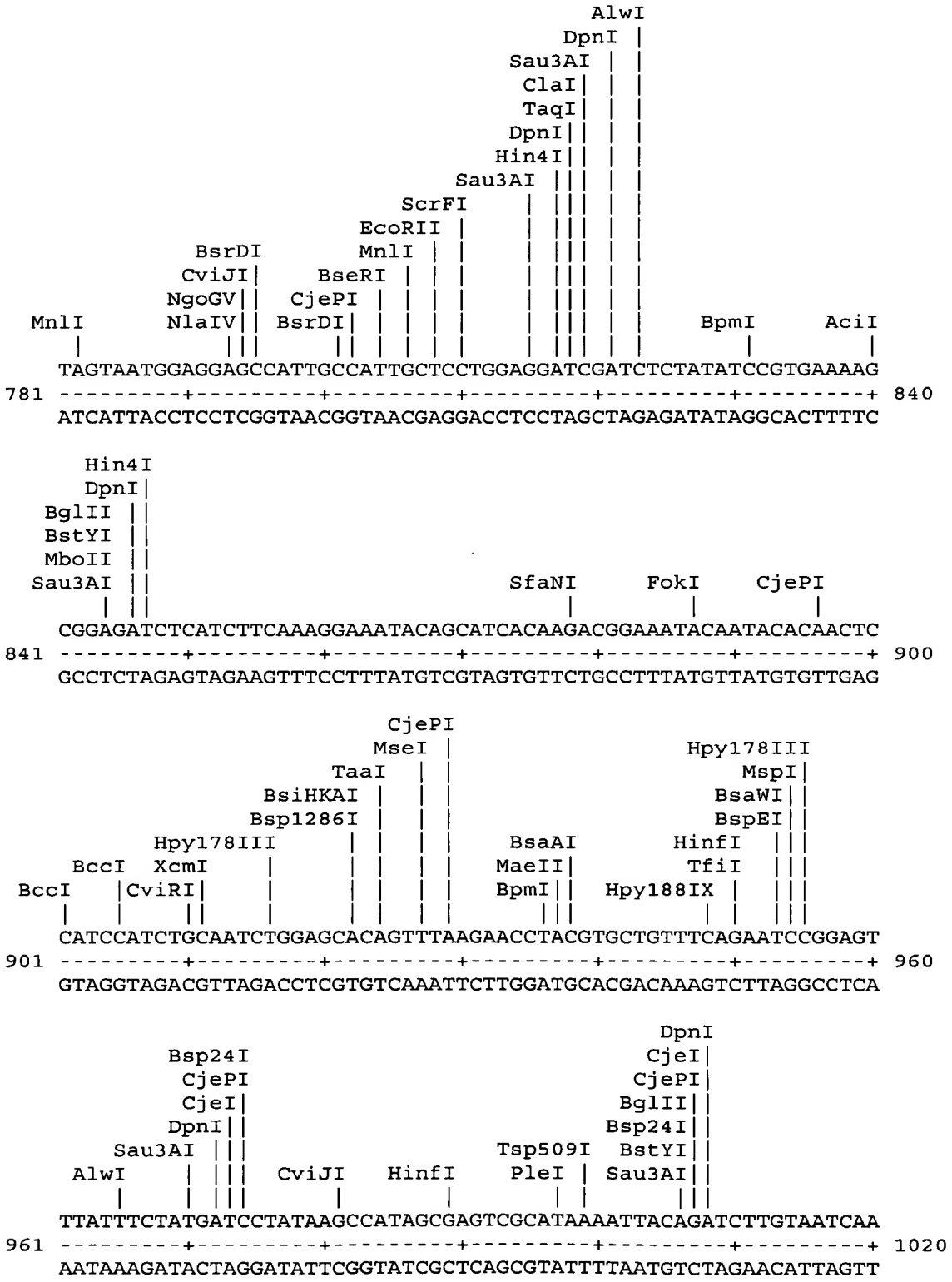

Figure 10E

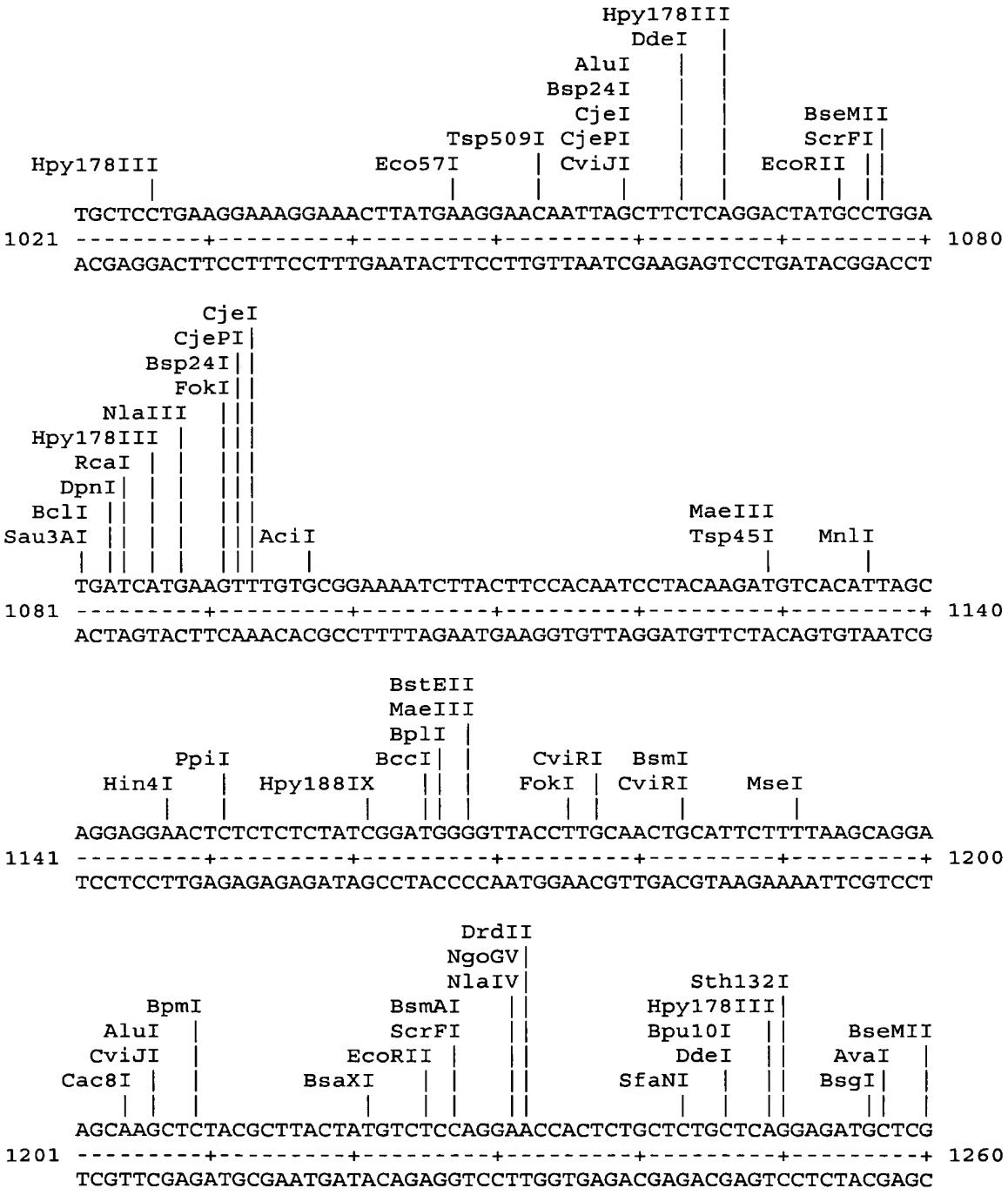

Figure 10F

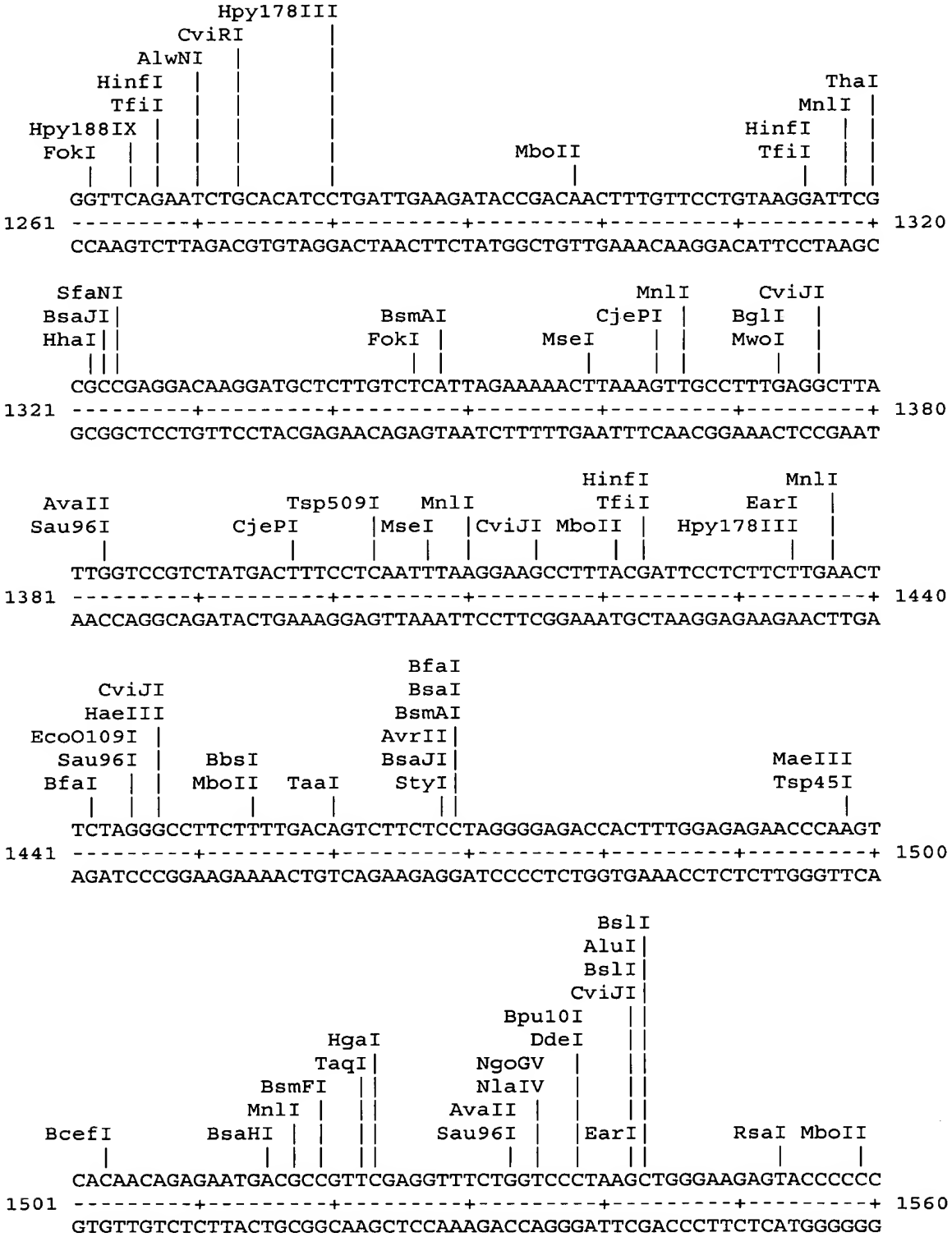

Figure 10G

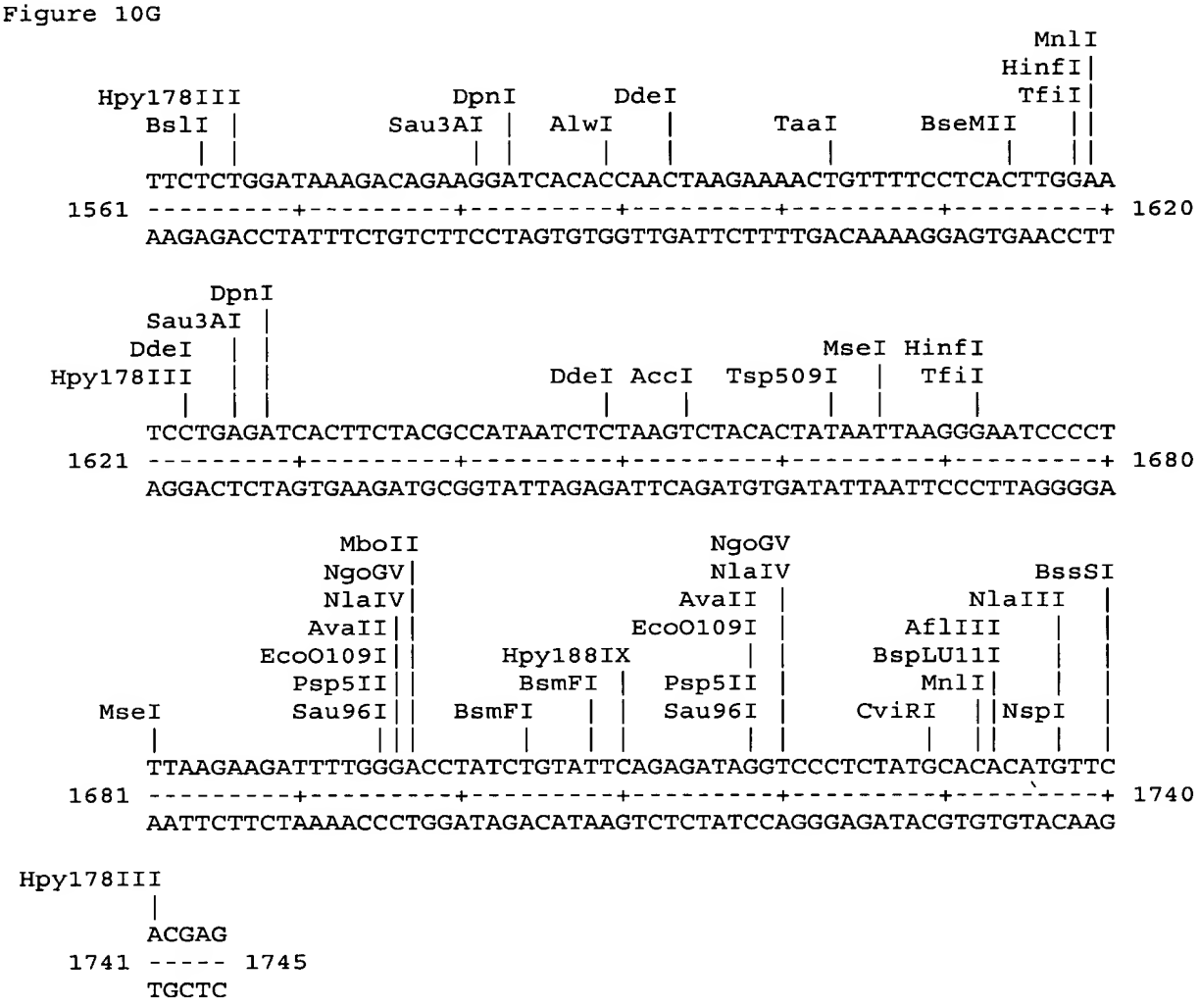

Figure 11A

Restriction enzyme analysis of CPN100985 (RY 66 - SEQ ID NO. 11)

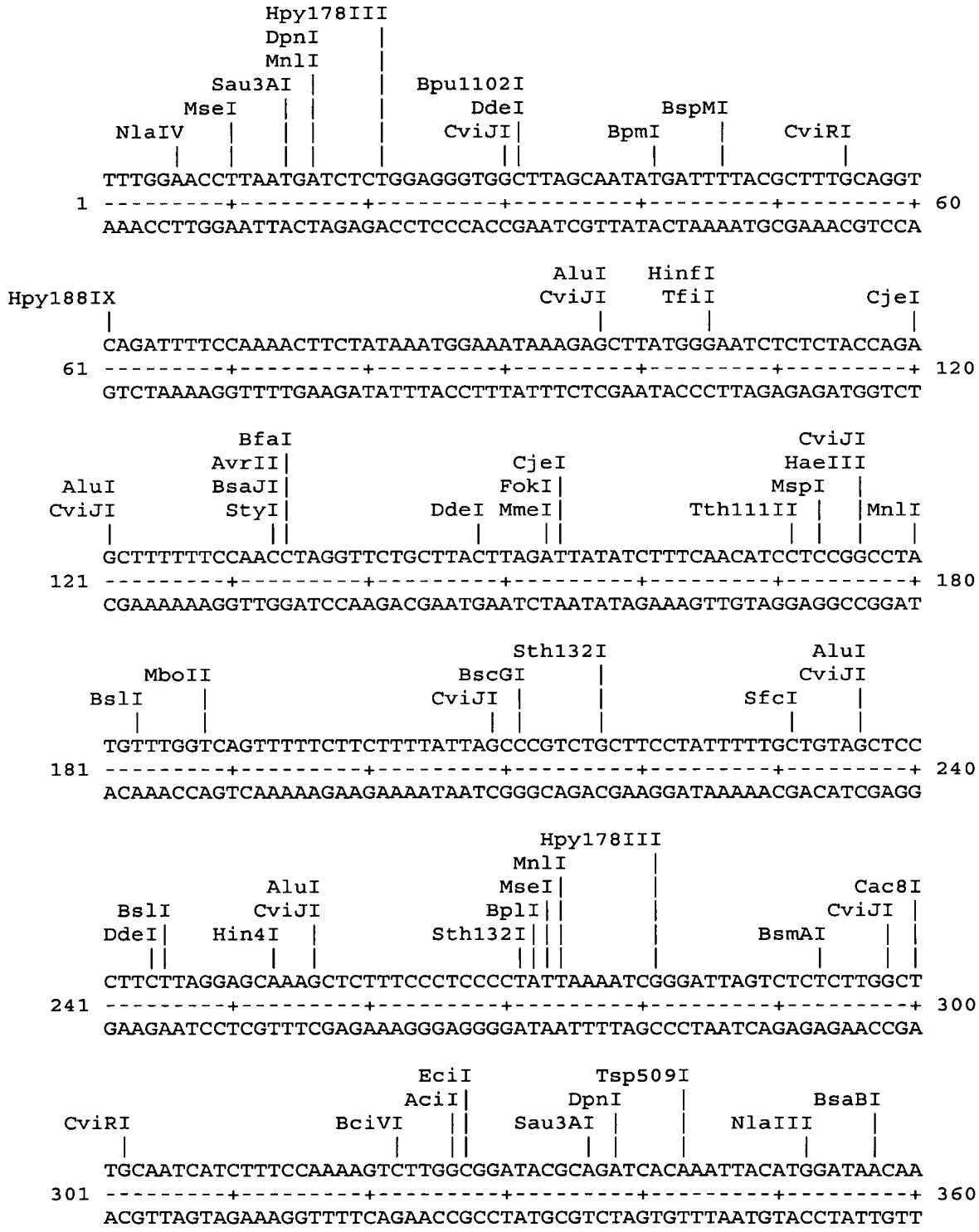

Figure 11B

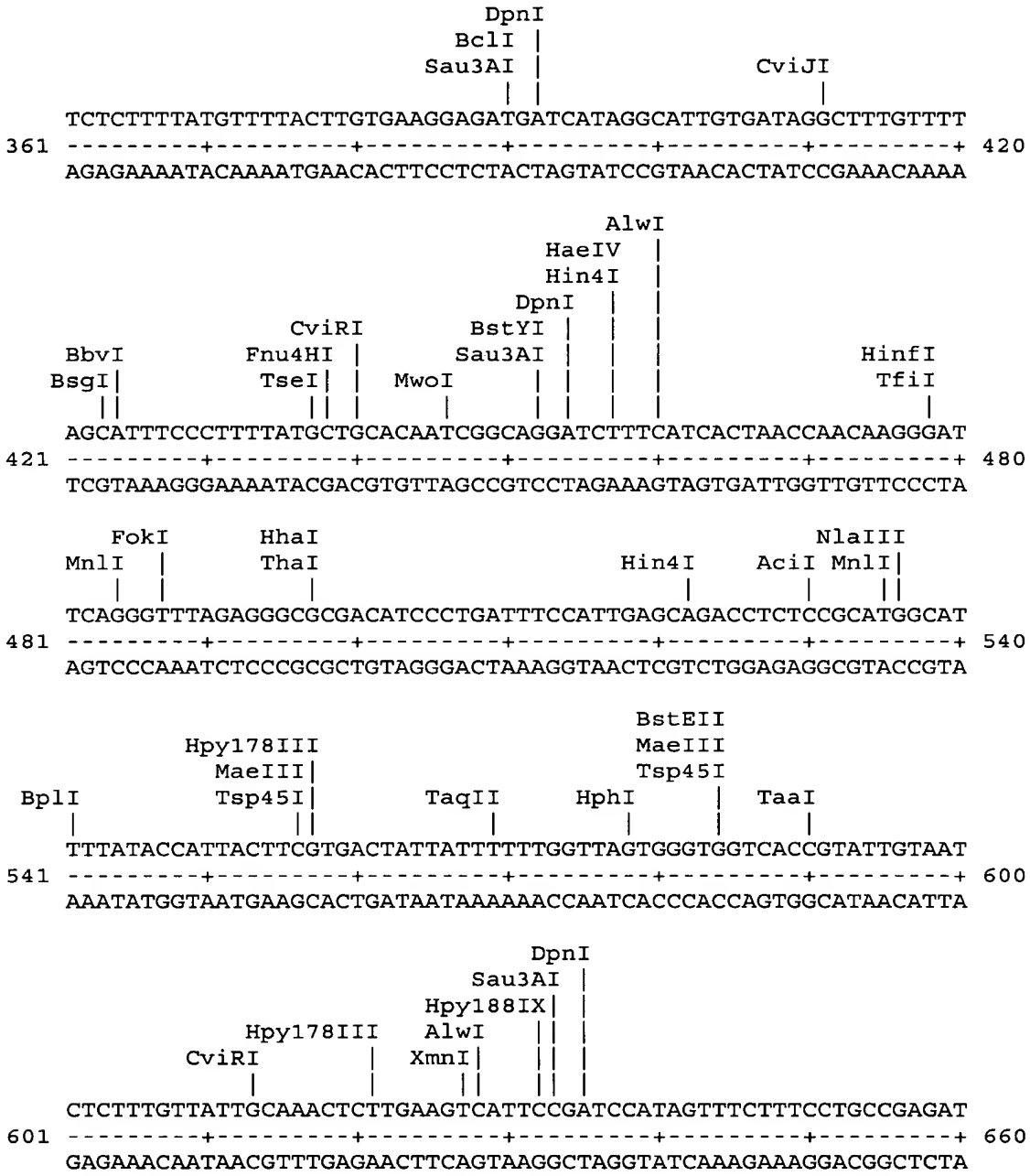

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Figure 11C

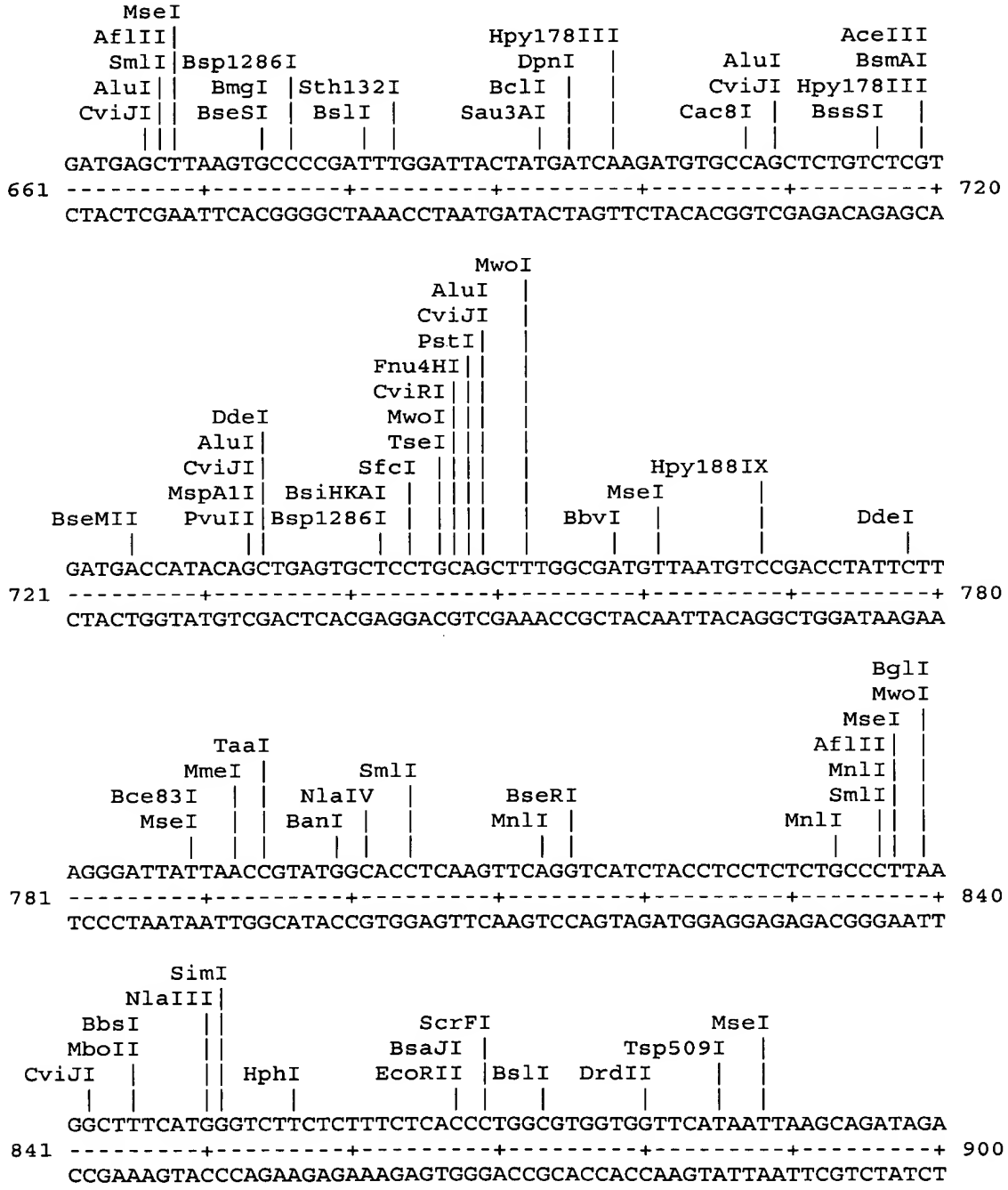

Figure 11D

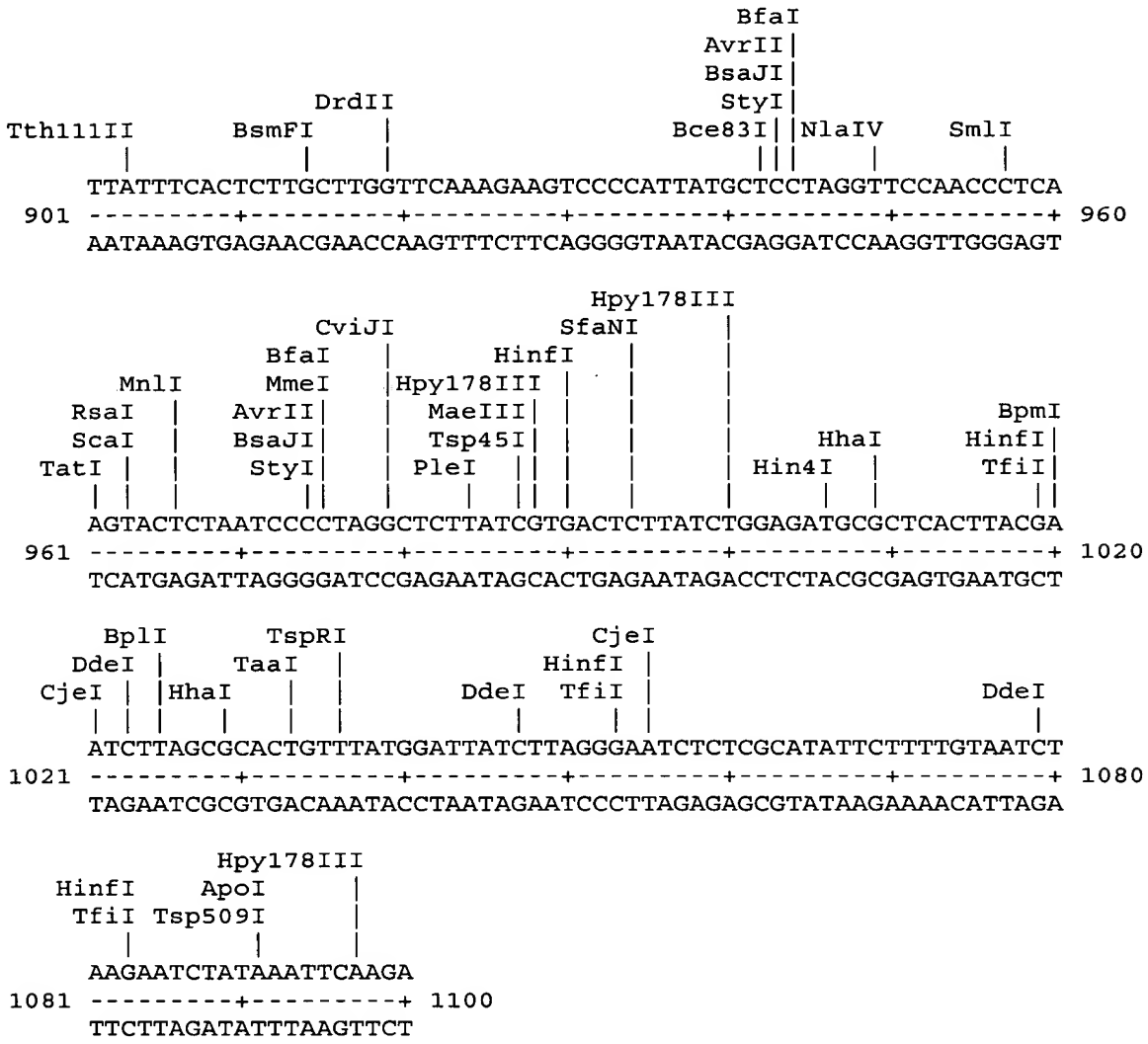

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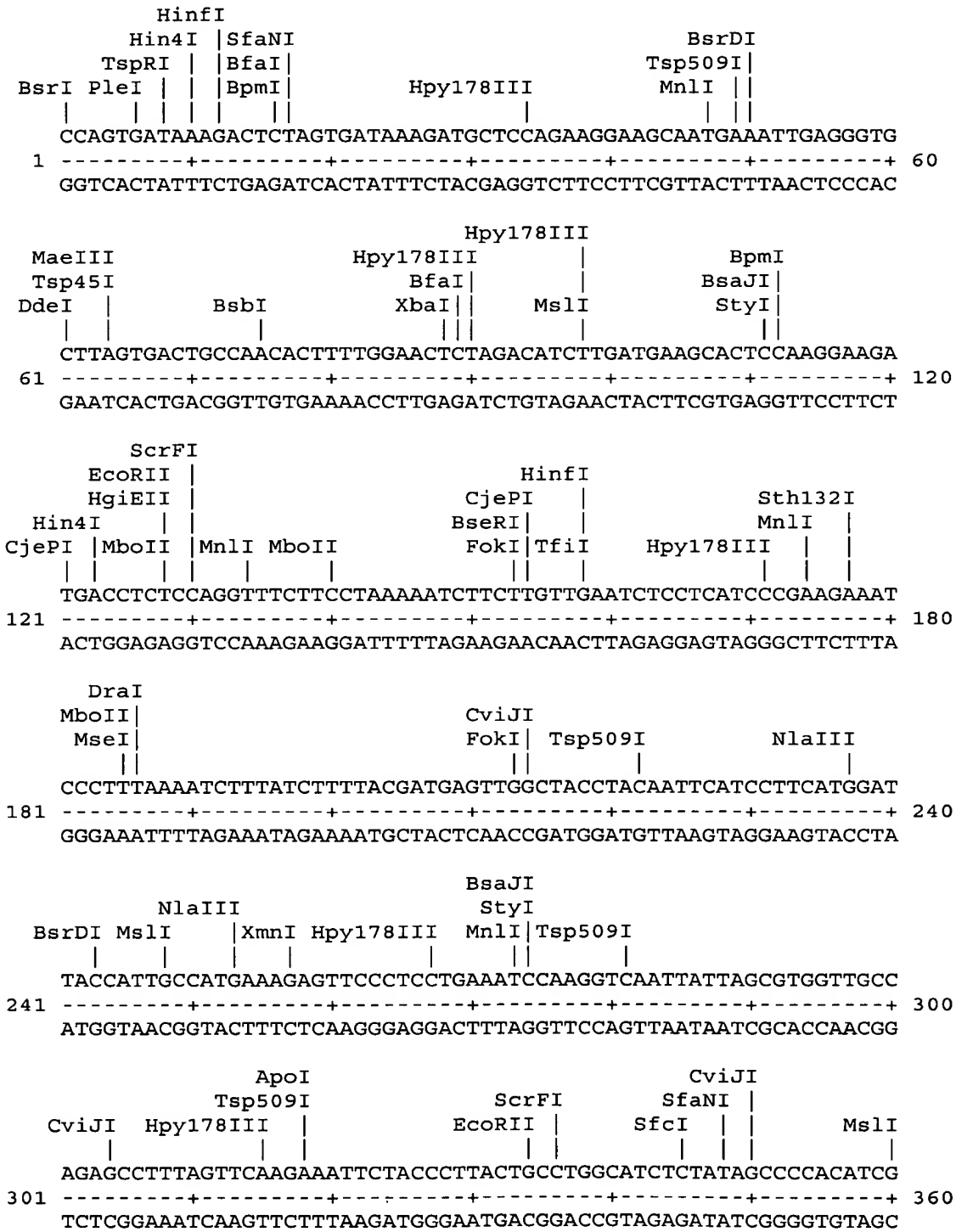
Figure 12A

Restriction enzyme analysis of CPN100987 (RY 67 - SEQ ID NO. 12)



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Appl. No.: 09/868,987

Figure 12B

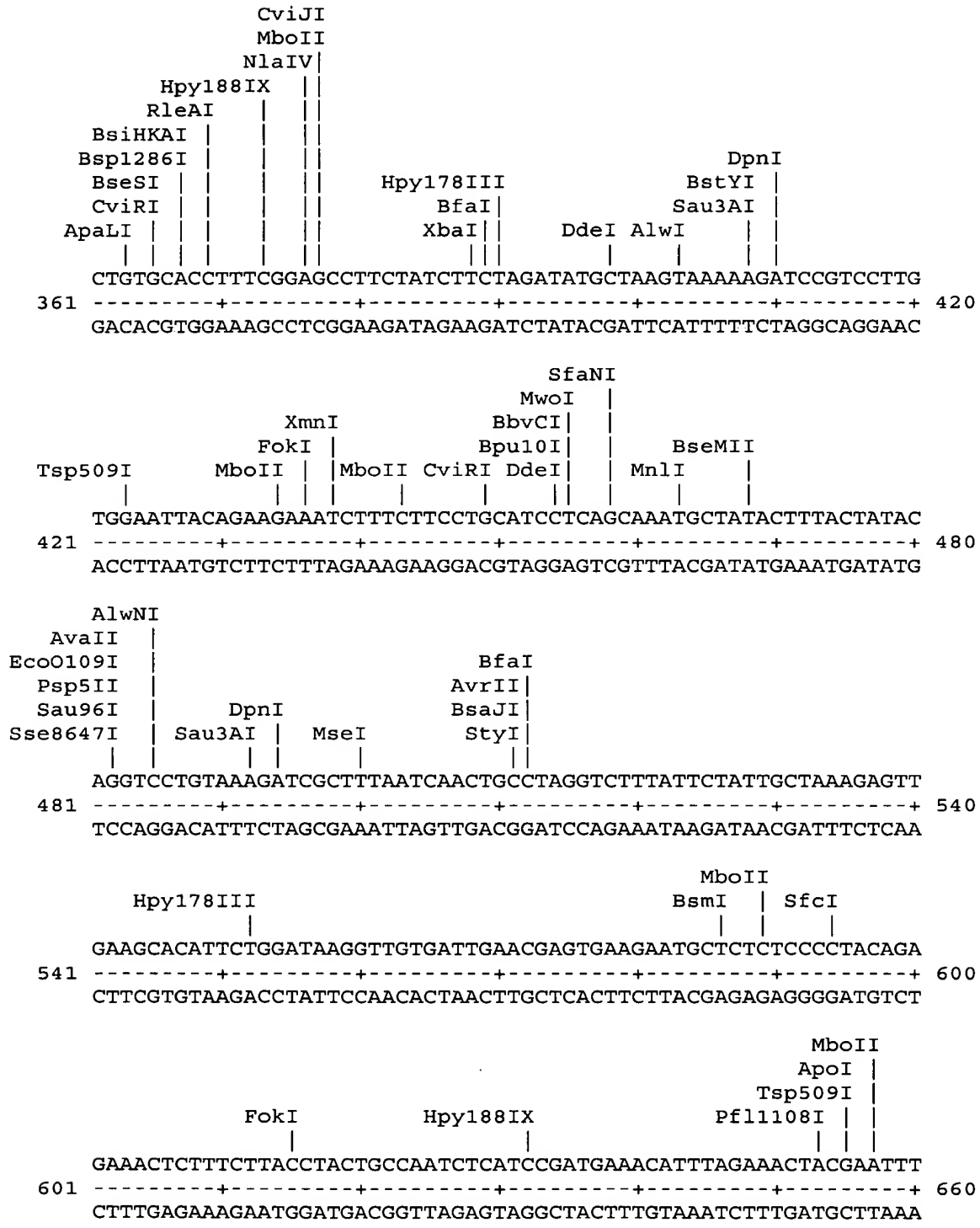
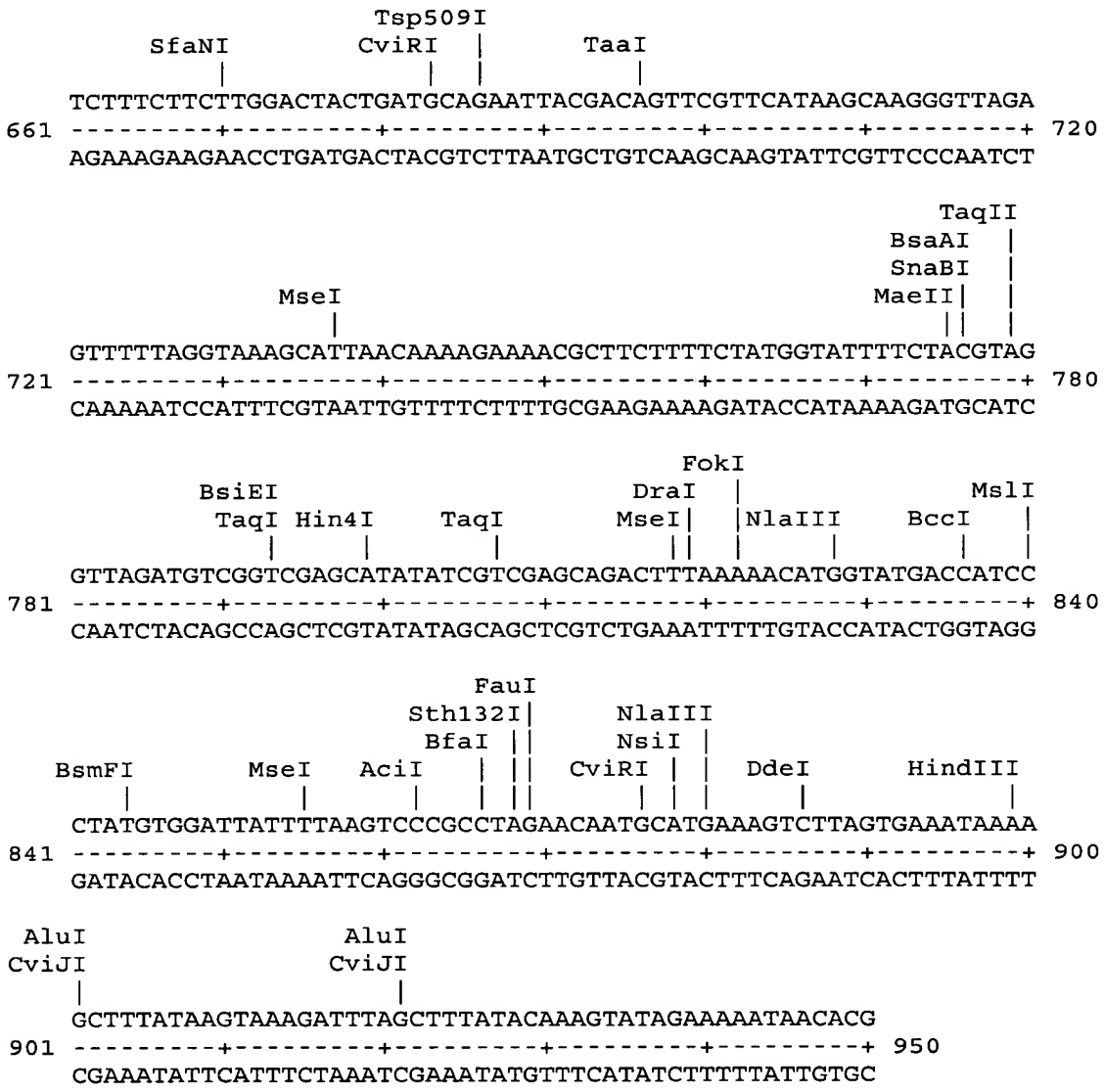


Figure 12C



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Appl. No.: 09/868,987

Figure 13A

Restriction enzyme analysis of CPN100988 (ry68 - SEQ ID NO. 13)

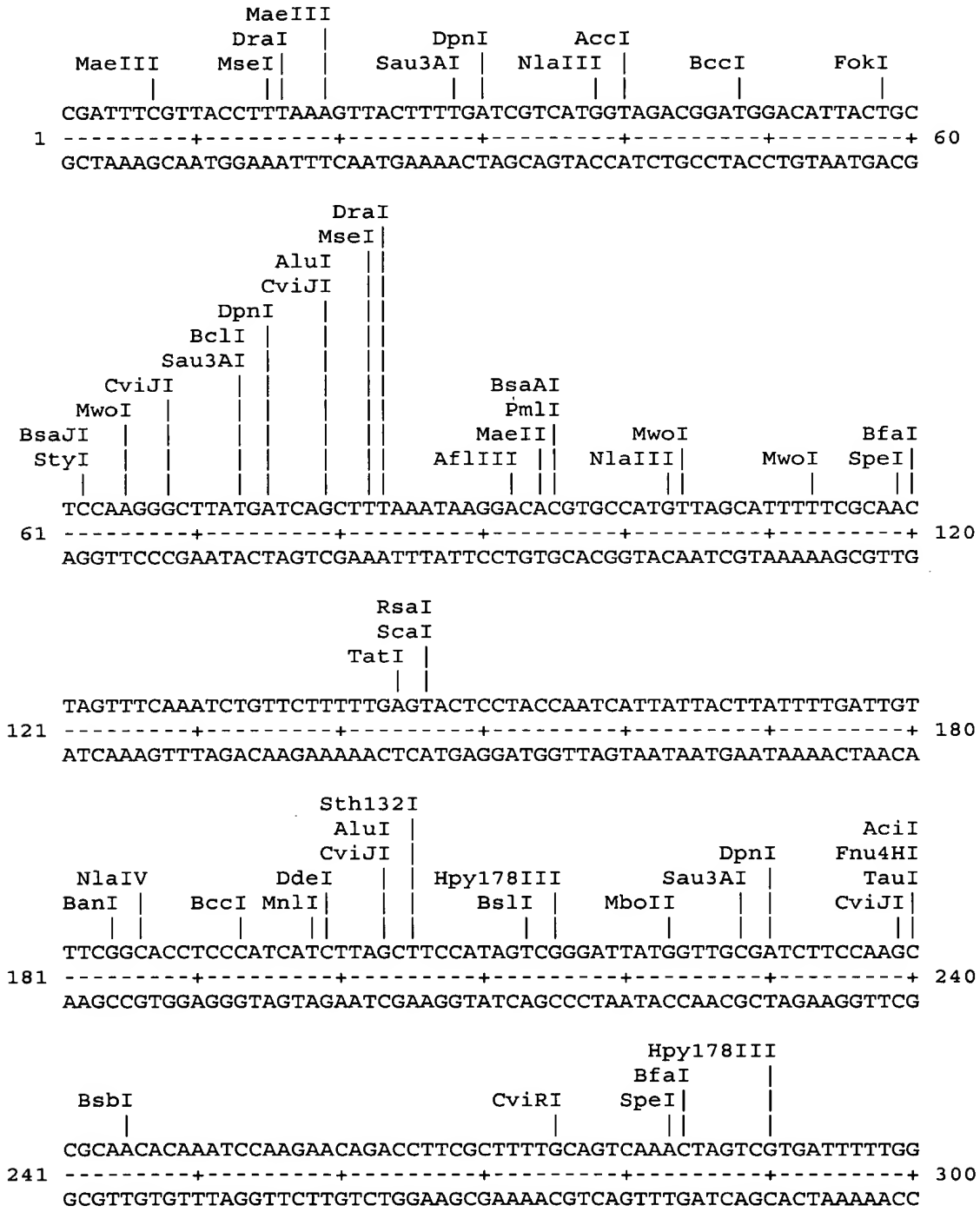

Figure 13B

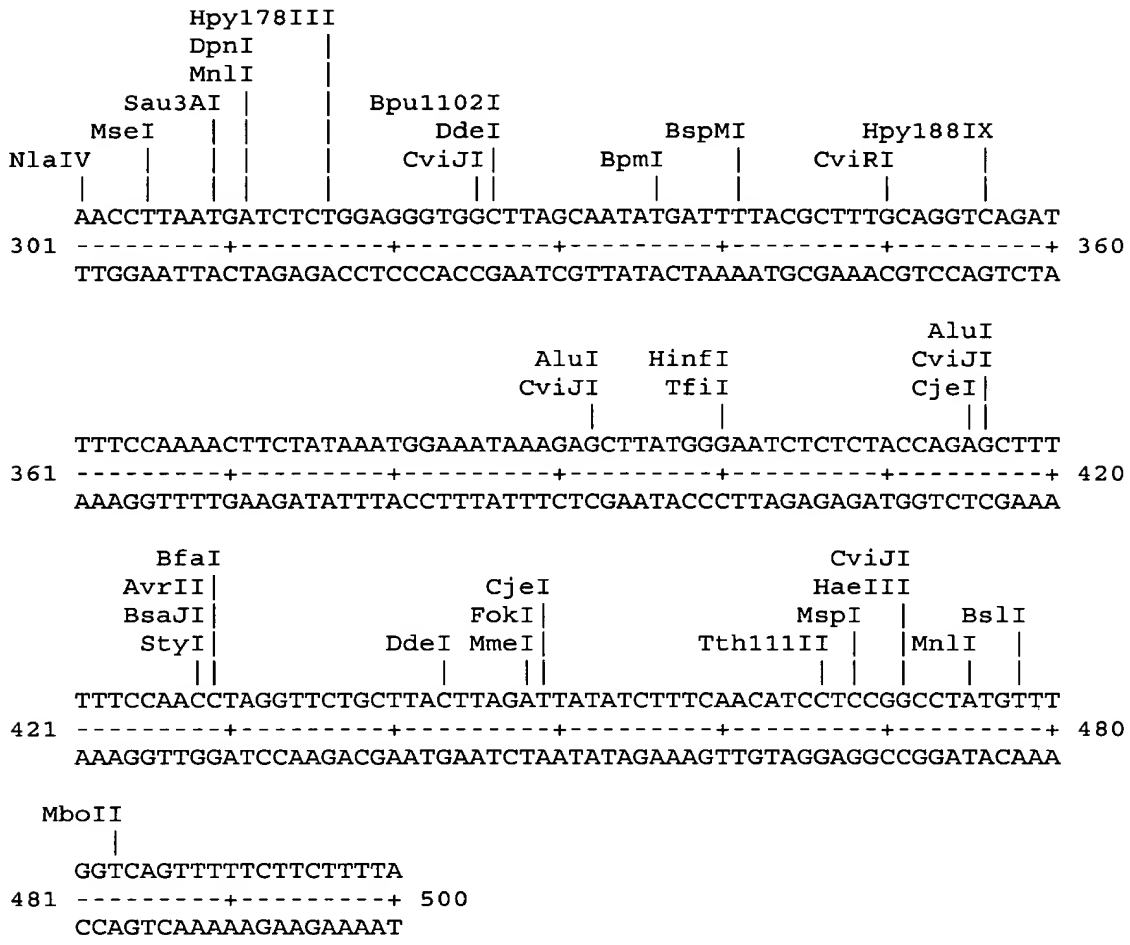

Figure 14: Identification of T- and B-cell epitopes from the amino acid sequences SEQ ID No. 14; ORF: cpn100686

```
  1 MVSSPILNVP LKNHASVSGK FTHREVSKLA SDLKSGAMSF VPEVLSEETI
 51 SSDLGKKQCT QGIISACCGL AMLIVLMSVY YRFGGVIASG AVLLNLLLIW
101 AALQYLDAPL TLSGLAGIVL AMGMAVDANV LVFERIREEF LLSQSLKKSV
151 EKGYTKAFGA IFDSNLTTVL ASALLFFLDT GPIKGFALTL ILGIFSSMFT
201 ALFMTKFFFM LWMNKTQHTQ LHMMNKFVGI KHDFLRGCKK LWAVSGSVFL
251 LGCVALGFGA WNSVLGMDFK GGYAFTFNPK EHGISDVAQM RGKVVHKLQE
301 AGLSSRDFRI QTFGSSEKIK IYFSDKALSY TKQIRASLLK LTIMSWRYCG
351 IVVRNRPRFL YGNSKRNAKF WSKVSSKLSK KMRYQATIGL LGALAIILLY
401 VSLRFEWQYA FSAVCALIHD LLATCAVLFI AHFFLKKIQI DLQAIGALMT
451 VLGYSLNNTL IIFDRIREDR QANLFTPMHV LVNDALQKTF SRTVMTTATT
501 LSVLLMLLFI GGSSVFNFAF IMTIGILLGT LSSLYIAPPL LLFMVRKENR
551 SK
```

Possible T cell epitope:

427 VLFIAHFFL

Possible B cell epitope:

465 RIREDRQAN

Figure 15: Identification of T- and B-cell epitopes from the amino acid sequences SEQ ID No. 15; ORF: cpn100696

```
  1 MSSNLHPVGG TGTGAAAPES VLNIVEEIAA SGSVTAGLQA ITSSPGMVNL
 51 LIGWAKTKFI QPIRESKLFQ SRACQITLLV LGILLVVAGL ACMFIFHSQL
101 GANAFWLIIP AAIGLIKLLV TSLCFDEACT SEKLMVFQKW AGVLEDQLDD
151 GILNNSNKIF GHVKTEGNTS RATTPVLNDG RGTPVLSPLV SKIARV
```

Possible T cell epitope:

133 KLMVFQKWA

Possible B cell epitope:

163: VKTEGNTSRAT

Figure 16: Identification of T- and B-cell epitopes from the amino acid sequences SEQ ID No. 16; ORF: cpn100709

```
  1 MTIRILAEGL AFRYGSKGPN IIHDVSFSVY DGDFIGIIGP NGGGKSTLTM
 51 LILGLLTPTF GSLKTFPSHS AGKQTHSMIG WVPQHFSYDP CFPISVKDVV
101 LSGRLSQLSW HGKYKKKDFE AVDHALDLVG LSDTTTTAFA HLSGGQIQRV
151 LLARALASYP EILILDEPTT NIDPDNQQRI LSILKKLNRT CTILMVTHDL
201 HHTTNYFNKV FYMNKTLHFI GRHFDLNRPI LLSSYKNQEF SCSPH
```

Possible T cell epitope:

212 YMNKTLHFI

Possible B cell epitopes:

109 SWHGKYKKKDFE

166 DEPTTNIDPDNQQR

Figure 17: Identification of T- and B-cell epitopes from the amino acid sequences SEQ ID No. 17; ORF: cpn100710

```
  1 MHKVIVFIFL TLYSLKSYGN DVIDKPHVLV SIAPYKFLVE QIAEETCFVY
 51 AIVTNHYDPH TYELPPQQIK ELRQGDLWFR IGEAFGKNLL EKPYMQQVDL
101 SQNVSLIQGK PCCNQHTTNY DTHTWLSPKN LKVQVETIVT TLSKKYPQHA
151 TLYQSNGEKL LLALDQLNEE ILTITSKAKQ RHILVSHGAF GYFCRDYNFS
201 QHTIEKSSHV EPSPKDVARV FRDIEQYKIS SVILLEYSGR RSSAMLADRF
251 HMHTVNLDPY AENVLVNLKT IATTFSSL
```

Possible T cell epitope:

125 WLSPKNLKV

Possible B cell epitope:

55 NHYDPHTYELPPQQIKELRQGD

Figure 18: Identification of T- and B-cell epitopes from the amino acid sequences SEQ ID No. 18; ORF: cpn100711

```
  1 MGPGSVLSNH SKEAGGIAIN NVIIDFSEIV PTKDNATVAP PTLKLVSRTN
 51 ADSKDKIDIT GTVTLLDPNG NLYQNSYLGE DRDITLFNID NSASGAVTAT
101 NVTLQGNLGA KKGYLGTWNL DPNSSGSKII LKWTFDKYLR WPYIPRDNHF
151 YINSIWGAQN SLVTVNQGIL GNMLNNARFE DPAFNNFWAS AIGSFLRKEV
201 SRNSDSFTYH GRGYTAAVDA KPRQEFILGA AFSQVFGHAE SEYHLDNYKH
251 KGSGHSTQAS LYAGNIFYFP AIRSRPILFQ GVATYGYMQH DTTTYYPSIE
301 EKNMANWDSI AWLFDLRFSV DLKEPQPHST ARLTFYTEAE YTRIRQEKFT
351 ELDYDPRSFS ACSYGNLAIP TGFSVDGALA WREIILYNKV SAAYLPVILR
401 NNPKATYEVL STKEKGNVVN VLPTRNAARA EVSSQIYLGS YWTLYGTYTI
451 DASMNTLVQM ANGGIRFVF
```

Possible T cell epitope:

312 WLFDLRFSV

Possible B cell epitope:

240: ESEYHLDNYKHKGSGHST

Figure 19: Identification of T- and B-cell epitopes from the amino acid sequences SEQ ID No. 19; ORF: cpn100877

```
  1 MRFSLCGFPL VFSFTLLSVF DTSLSATTIS LTPEDSFHGD SQNAERSYNV
 51 QAGDVYSLTG DVSISNVDNS ALNKACFNVT SGSVTFAGNH HGLYFNNISS
101 GTTKEGAVLC CQDPQATARF SGFSTLSFIQ SPGDIKEQGC LYSKNALMLL
151 NNYVVRFEQN QSKTKGGAIS GANVTIVGNY DSVSFYQNAA TFGGAIHSSG
201 PLQIAVNQAE IRFAQNTAKN GSGGALYSDG DIDIDQNAYV LFRENEALTT
251 AIGKGGAVCC LPTSGSSTPV PIVTFSDNKQ LVFERNHSIM GGGAIYARKL
301 SISSGGPTLF INNISYANSQ NLGGAIAIDT GGEISLSAEK GTITFQGNRT
351 SLPFLNGIHL LQNAKFLKLQ ARNGYSIEFY DPITSEADGS TQLNINGDPK
401 NKEYTGTILF SGEKSLANDP RDFKSTIPQN VNLSAGYLVI KEGAEVTVSK
451 FTQSPGSHLV LDLGTKLIAS KEDIAITGLA IDIDSLSSSS TAAVIKANTA
501 NKQISVTDSI ELISPTGNAY EDLRMRNSQT FPLLSLEPGA GGSVTVTAGD
551 FLPVSPHYGF QGNWKLAWTG TGNKVGEFFW DKINYKPRPE KEGNLVPNIL
601 WGNAVDVRSL MQVQETHASS LQTDRGLWID GIGNFFHVSA SEDNIRYRHN
651 SGGYVLSVNN EITPKHYTSM AFSQLFSRDK DYAVSNNEYR MYLGSYLYQY
701 TTSLGNIFRY ASRNPNVNVG ILSRRFLQNP LMIFHFLCAY GHATNDMKTD
751 YANFPMVKNS WRNNCWAIEC GGSMPLLVFE NGRLFQGAIP FMKLQLVYAY
801 HGDFKETTAD GRRFSNGSLT SISVPLGIRF EKLALSQDVL YDFSFSYIPD
851 IFRKDPSCEA ALVISGDSWL VPAAHVSRHA FVGSGTGRYH FNDYTELLCR
901 GSIECRPHAR NYNINCGSKF RF
```

Possible T cell epitope:

146 ALMLLNNYV

Possible B cell epitope:

581 DKINYKPRPEKEG

Figure 20: Identification of T- and B-cell epitopes from the amino acid sequences SEQ ID No. 20; ORF: CPN100325

```
  1 MPSSWKRLLQ VLSHKIAATE SGGGIYAKDI QLQALPGSFT ITDNKVETSL
 51 TTSTNLYGGG IYSSGAVTLT NISGTFGITG NSVINTATSQ DADIQGGGIY
101 ATTSLSINQC NTPILFSNNS AATKKTSTTK QIAGGAIFSA AVTIENNSQP
151 IIFLNNSAKS EATTAATAGN KDSCGGAIAA NSVTLTNNPE ITFKGNYAET
201 GGAIGCIDLT NGSPPRKVSI ADNGSVLFQD NSALNRGGAI YGETIDISRT
251 GATFIGNSSK HDGSAICCST ALTLAPNSQL IFENNKVTET TATTKASINN
301 LGAAIYGNNE TSDVTISLSA ENGSIFFKNN LCTATNKYCS IAGNVKFTAI
351 EASAGKAISF YDAVNVPPKK QLLKS
```

Possible T cell epitope:

226 VLFQDNSAL

Possible B cell epitope:

257 NSSKHDG

Figure 21: Identification of T- and B-cell epitopes from the amino acid sequences SEQ ID No. 21; ORF: CPN100368

```
  1 MKYSLPWLLT SSALVFSLHP LMAANTDLSS SDNYENGSSG SAAFTAKETS
 51 DASGTTYTLT SDVSITNVSA ITPADKSCFT NTGGALSFVG ADHSLVLQTI
101 ALTHDGAAIN NTNTALSFSG FSSLLIDSAP ATGTSGGKGA ICVTNTEGGT
151 ATFTDNASVT LQKNTSEKDG AAVSAYSIDL AKTTTAALLD QNTSTKNGGA
201 LCSTANTTVQ GNSGTVTFSS NTATDKGGGI YSKEKDSTLD ANTGVVTFKS
251 NTAKTGGAWS SDDNLALTGN TQVLFQENKT TGSAAQANNP EGCGGAICCY
301 LATATDKTGL AISQNQEMSF TSNTTTANGG AIYATKCTLD GNTTLTFDQN
351 TATAGCGGAI YTETEDFSLK GSTGTVTFST NTAKTGGALY SKGNSSLTGN
401 TNLLFSGNKA TGPSNSSANQ EGCGGAILAF IDSGSVSDKT GLSIANNQEV
451 SLTSNAATVS GGAIYATKCT LTGNGSLTFD GNTAGTSGGA IYTETEDFTL
501 TGSTGTVTFS TNTAKTGGAL YSKGNNSLSG NTNLLFSGNK ATGPSNSSAN
551 QEGCGGAILS FLESASVSTK KGLWIEDNEN VSLSGNTATV SGGAIYATKC
601 ALHGNTTLTF DGNTAETAGG AIYTETEDFT LTGSTGTVTF STNTAKTAGA
651 LHTKGNTSFT KNKALVFSGN SATATATTTT DQEGCGGAIL CNISESDIAT
701 KSLTLTENES LSFINNTAKR SGGGIYAPKC VISGSESINF DGNTAETSGG
751 AIYSKNLSIT ANGPVSFTNN SGGKGGAIYI ADSGELSLEA IDGDITFSGN
801 RATEGTSTPN SIHLGARGKI TKLAAAPGHT IYFYDPITME APASGGTIEE
851 LVINPVVKAI VPPPQPKNGP I
```

Possible T cell epitope:

```
  7   WLLTSSALV
```

Possible B cell epitopes:

```
162   QKNTSEKDG
538   GNKATGPSNSSANQEG
```

Figure 22: Identification of T- and B-cell epitopes from the amino acid sequences SEQ ID No. 22; ORF: CPN100624

```
  1 MTNSIFISKF GCLCDPFVSA FYPTALCCSL SGNEVPNLAS CQMSRKDISA
 51 FHTSPSFRLN VTPEPLVSSF RPSNLLNGFG HDITQDITIT GNSINSVIDY
101 NYHYEDGGIL ACKNLFISEN KGNLSFERNS SHSSGGALYS VRECWISKNQ
151 NYSFISNAAS LATTTTSGFG GAIHALDSYI TNNLGEGQFL DNVSKNRGGA
201 IYVGVSLSIT DNLGPIVIKK NQTLEDSSFG GGIFCRAVNI ERNYQNIQIN
251 DNASGQGVVY FLPLGVIISS NKEIIEISNH SASSINTASG KLYPGGGGIM
301 CTSLSHENNP KGLIFNNKTA ALSGGVYTRD LSSSKITVRT AFINNSATSG
351 GALINLSGIG STPQNFFLSA DYGDILFNNN TITSSSPQPG YRNALYAAPG
401 INLKLGARQG YKILFYDPID HDQTTTDPIV FNYEPHHLGT VLFSGINVDS
451 NATNPLNFLS KFSNSSRLER GVLAIEDRAA ISCKTLSQTG GILRLGNAAL
501 IRTKGPGSSI NFNAIAINLP SILQSEASAP KFWIYPTLTG STYSEDTSST
551 ITLSGPLTFL NDENENPYDS LDLSEPRKDI PPPLPPRCDC KKIDTSNLIV
601 EAMNLDEHYG YQGIWSPYWM ETTTTTSSTV PEQTNTNHRQ LYVDWTPVGY
651 RPNPERHGEF IANTLWQSAY NALLGIRILP PQNLKEHDLE ASLQGLGLLI
701 NQHNREGRKG FRNHTTGYAA TTSAKTAARH SFSLGFAQMF SKTRERQSPS
751 TTSSHNYFAG LRFDSLLFRD FISTGLSLGY SYGDHHMLCH YTEILKGSSK
801 AFFNNHTLVA SLDCTFLPAR ITRTLELQPF ISAIALRCSQ ASFQETGDHI
851 RKFHPKHPLT DLSSPIGFRS EWKTSHHIPM LWTTEISYVP TLYRKNPEMF
901 TTLLISNGTW TTQATPVSYN SVAAKIKNTS QLFSRVTLSL DYSAQVSSST
951 VGQYLKAESH CTF
```

Possible T cell epitope:

640 QLYVDWTPV

Possible B cell epitopes:

701 NQHNREGRKGFRNHTTG

741 SKTRERQSPSTTSSHNY

Figure 23: Identification of T- and B-cell epitopes from the amino acid sequences SEQ ID No. 23; ORF: CPN100633

```
  1 MTILRNFLTC SALFLALPAA AQVVYLHESD GYNGAINNKS LEPKITCYPE
 51 GTSYIFLDDV RISNVKHDQE DAGVFINRSG NLFFMGNRCN FTFHNLMTEG
101 FGAAISNRVG DTTLTLSNFS YLAFTSAPLL PQGQGAIYSL GSVMIENSEE
151 VTFCGNYSSW SGAAIYTPYL LGSKASRPSV NLSGNRYLVF RDNVSQVYGG
201 AISTHNLTLT TRGPSCFENN HAYHDVNSNG GAIAIAPGGS ISISVKSGDL
251 IFKGNTASQD GNTIHNSIHL QSGAQFKNLR AVSESGVYFY DPISHSESHK
301 ITDLVINAPE GKETYEGTIS FSGLCLDDHE VCAENLTSTI LQDVTLAGGT
351 LSLSDGVTLQ LHSFKQEASS TLTMSPGTTL LCSGDARVQN LHILIEDTDN
401 FVPVRIRAED KDALVSLEKL KVAFEAYWSV YDFPQFKEAF TIPLLELLGP
451 SFDSLLLGET TLERTQVTTE NDAVRGFWSL SWEEYPPSLD KDRRITPTKK
501 TVFLTWNPEI TSTP
```

Possible T cell epitope:

640 QLYVDWTPV

Possible B cell epitope:

482 WEEYPPSLDKDRRITPTKK

Figure 24: Identification of T- and B-cell epitopes from the amino acid sequences SEQ ID No. 24; ORF: cpn100985

```
  1 MGISLPELFS NLGSAYLDYI FQHPPAYVWS VFLLLLARLL PIFAVAPFLG
 51 AKLFPSPIKI GISLSWLAII FPKVLADTQI TNYMDNNLFY VLLVKEMIIG
101 IVIGFVLAFP FYAAQSAGSF ITNQQGIQGL EGATSLISIE QTSPHGILYH
151 YFVTIIFWLV GGHRIVISLL LQTLEVIPIH SFFPAEMMSL SAPIWITMIK
201 MCQLCLVMTI QLSAPAALAM LMSDLFLGII NRMAPQVQVI YLLSALKAFM
251 GLLFLTLAWW FIIKQIDYFT LAWFKEVPIM LLGSNPQVL
```

Possible T cell epitope:

```
 83   YMDNNLFYV
```

Possible B cell epitope:

```
78    TQITNYMDNN
```

Figure 25: Identification of T- and B-cell epitopes from the amino acid sequences SEQ ID No. 25; ORF: cpn100987

```
  1 MKHSKEDDLS RFLPKNLLVE SPHPEEIPLK SLSFTMSWLP TIHPSWITIA
 51 MKEFPPEIQG QLLAWLPEPL VQEILPLLPG ISIAPHRCAP FGAFYLLDML
101 SKKIRPCGIT EEIFLPASSA NAILYYTGPV KIALINCLGL YSIAKELKHI
151 LDKVVIERVK NALSPTEKLF LTYCQSHPMK HLETTNFLSS WTTDAELRQF
201 VHKQGLEFLG KALTKENASF LWYFLRRLDV GRAYIVEQTL KTWYDHPYVD
251 YFKSRLEQCM KVLVK
```

Possible T cell epitope:

```
220   FLWYFLRRL
```

Possible B cell epitope:

```
1     MKHSKEDDLSR
```

Figure 26: Identification of T- and B-cell epitopes from the amino acid sequences SEQ ID No. 26; ORF: cpn100988

```
  1 MLAFFATSFK SVLFEYSYQS LLLILIVSAP PIILASIVGI MVAIFQAATQ
 51 IQEQTFAFAV KLVVIFGTLM ISGGWLSNMI LRFAGQIFQN FYKWK
```

Possible T cell epitope:

21 LLLILIVSA

Possible B cell epitope:

89 QNFYKWK